

# **MONTANA APPRAISAL MANUAL**

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**PROPERTY ASSESSMENT DIVISION  
MONTANA DEPARTMENT OF REVENUE**



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# FOREWORD

The purpose of the Montana Appraisal Manual is to establish standards, procedures, and guidelines to be followed by appraisers in the appraisal of real estate in the State of Montana.

While this manual may not answer every question related to property valuation, it does

provide procedures that can ensure a uniform statewide approach to value. The proper use of this manual is important in maintaining a quality valuation system.

This manual is supplied to Montana Appraisers for the purpose of valuing locally assessed properties.

# INTRODUCTION

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## THE MONTANA APPRAISAL MANUAL

This manual has been prepared for the use of the Montana Department of Revenue, Property Assessment Division appraisal staff. It is designed to be used in conjunction with the 2009 statewide reappraisal. The data collection and appraisal procedures are specific for the 2009 reappraisal cycle.

The appraisal manual is an integral part of the computer assisted mass appraisal process. It provides the procedures to be followed in accurately and consistently collecting information about properties. It also presents the basic methodologies to be applied in estimating the market value of property considering the three accepted approaches to value: cost, income, and sales comparison.

The appraisal manual is organized into five parts:

### **PART ONE: APPRAISAL PLAN**

Outlines the plan for conducting the 2009 reappraisal cycle and implementing the new values at the conclusion of the reappraisal.

### **PART TWO: APPRAISAL THEORY**

Describes fundamental appraisal theory and the basis for the three commonly accepted approaches to value. It further describes the mass appraisal process, distinguishing it from the appraisal of individual properties.

### **PART THREE: DATA TABS**

Describes the information that is collected for each property. It is organized into four

sections, each dealing with a specific type of information.

As part of the mass appraisal process, information is collected on each property. A standard form is used to record this information in the field. Two data collection forms have been designed for use in conjunction with this manual. Some of the information on these forms is common to all properties; the portion of the form used to list data for improvements is unique to each form.

Common PVAS Data is information that is collected on every property. It includes parcel identification data, site address, land breakdown information, sales data, etc.

Residential and Agricultural Improvements deals with the dwelling, mobile home, and residential and agricultural outbuilding data to be collected on each property. Where necessary, you may need to refer to more detailed information provided in later sections of the manual on quality grades and outbuildings.

Commercial and Industrial Improvements discusses the information to be gathered for commercial and industrial structures.

Income and Expense Data describes the collection of economic information on commercial properties using the operating statement; and the transfer of this information into the PVAS system.

On-Line Sales History deals with the land and improvement data present on residential and commercial property at the time of sale.

## **PART FOUR: REPLACEMENT COST**

Provides the specifications for the quality grades and various structure types as described in part three. It also describes the procedures for applying the cost approach to estimate the market value of property.

Estimating Replacement Cost New briefly describes the general steps that the appraiser must follow in determining the replacement cost of an improvement.

The specific procedures for calculating replacement costs for different types of structures is divided into four categories listed below. Each category includes quality grade specifications, and pictures to aid in the classification and grading of structures.

Dwellings

Mobile Homes

Other Buildings and Yard Improvements

Commercial Buildings

Depreciation describes the procedure

for determining the market value using the replacement cost. It deals with the normal depreciation and economic condition factors which must be applied in adjusting the value. Depreciation tables are provided as guidelines for use with dwellings, mobile homes, residential and agricultural outbuildings, and commercial structures.

Detailed cost information needed to calculate the replacement cost new less depreciation for each structure type valued in the computer-assisted Property Valuation Assessment System (PVAS) is provided. This section provides the cost formula to be used, the cost factors to be used, and the depreciation factors to be used, to calculate the replacement cost new less depreciation.

## **PART FIVE: GLOSSARY**

Contains the glossary, which includes abbreviations and definitions of terms that are used in various places and for various purposes throughout the manual.

# PART ONE: APPRAISAL PLAN

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## REAPPRAISAL PLAN

The 2009 Montana reappraisal plan implements the legislature's cyclical reappraisal program set forth in 15-7-111, MCA. The plan consists of seven parts: residential appraisal, commercial appraisal, agricultural and forest land appraisal, industrial appraisal, certification and training requirements, manuals, and progress reporting.

The Montana reappraisal plan provides for the valuation of residential property, commercial property, agricultural and forest land property, and industrial property. PVAS is used to assist in the valuation process. The department's plan is to determine a new appraised value for each parcel of land, each residential improvement, each commercial improvement, each agricultural improvement, and each industrial improvement. The department will enter the new appraised values on the tax rolls for tax year 2009.

The results of this plan apply to tax years beginning January 1, 2009, and extending through December 31, 2014. All property is appraised at the market value as of July 1, 2008.

## 2009 RESIDENTIAL REAPPRAISAL PLAN

The appraisal of residential property consists of field reviews; the collection, verification and analysis of sales information; the data entry of missing or updated information, new improvements, and sales information; the development and review of computer assisted land pricing (CALP) models, the development of market models/benchmarking, the use of door hangers where appropriate, the use of self-reporting forms, where ap-

propriate; and final determinations of value. Multiple field reviews of each property will be kept to an absolute minimum.

The appraisal plan provides for field reviews to be conducted. Field reviews of residential property consist of an internal or external observation to determine the accuracy of existing information on the property record card, the observation of condition, the review of grade and depreciation and the collection of additional data. No call-backs will be made to the property unless specifically requested by the taxpayer or department.

Residential property data entry consists of correcting, updating, and adding residential property data on the Department of Revenue's PVAS. The process will also include the review of edit reports and the addition of supplementary data to PVAS.

The collection, verification, analysis and data entry of sales information is an important component of PVAS. Accuracy of sales information is critical to the development of accurate sales comparison models, individual property final value determinations and the defense of final value estimates.

The development of market models using PVAS is a requirement for property valuation during the reappraisal cycle. The key components that influence value and the appropriate level of influence are determined through use of multiple regression analysis. Staff may develop separate sales comparison models for each neighborhood or by combining similar neighborhoods.

Property Record Cards or Reports are generated and reviewed by appraisal staff. These sheets include physical characteris-

tics and component information, sales, basic ownership, and valuation information. The review will consist of analyzing and collecting component information such as condition and style of improvements. This review will allow the appraiser to compare property information to an estimate of value. Discrepancies in data or the collection of additional information required by the review will result in the update of PVAS data.

Final determinations of value are conducted once all required field and program needs of PVAS are met. The appraisal value for residential property may include indicators of value using the cost approach, and the sales comparison approach.

The results of this rule apply to tax years beginning January 1, 2009, and extending through December 31, 2014. All property is appraised at the market value as of July 1, 2008.

## **2009 COMMERCIAL REAPPRAISAL PLAN**

The appraisal of commercial property consists of field reviews; collection, verification and analysis of sales and income information; data entry of sales and income information; development and review of computer assisted land pricing (CALP) models, development of income models/benchmarking; and final determinations of market value.

The appraisal plan provides for field reviews. A field review of commercial property consists of an internal or external observation to determine accuracy of existing information on the inventory content sheet and property record card, to observe condition; to review depreciation assignment; and to collect additional data.

Commercial property data consists of

correcting, updating and adding commercial property data on the Department of Revenue PVAS.

The collection, verification, analysis and data entry of sales and income information is an important component of PVAS. Accuracy of sales information and income information is critical to accurate land valuation; to benchmarking; to the development of accurate income models and sales comparison models; to individual property final value determinations; and to the defense of final value estimates.

Commercial lots and tracts are valued through the use of CALP models. Homogeneous areas within each county are geographically defined as neighborhoods. The CALP models will reflect July 1, 2008 land market values.

The development of income models using PVAS is a component for property valuation during the reappraisal cycle. Staff may develop separate income models for each neighborhood.

Property Record Cards or reports are generated and reviewed by appraisal staff. These sheets include physical characteristics and component information, income information, sales information, basic ownership information, and valuation information. The review will consist of analyzing and collecting component information. This review will allow the appraiser to review and compare property information to an estimate of value. Discrepancies in data or the collection of additional information required by the review will result in the update of PVAS data.

Final determinations of value are conducted once all required field and program needs of PVAS are met. The appraisal value for commercial property may include indi-

cators of value using the cost approach, the income approach, and, when possible, the sales comparison approach. The appraisal value supported by the most defensible valuation information serves as the value for ad valorem tax purposes.

The results of this rule apply to tax years beginning January 1, 2009, and extending through December 31, 2014. All property is appraised at the market value as of July 1, 2008.

## **2009 AGRICULTURAL/FOREST LAND AND IMPROVEMENTS REAPPRAISAL PLAN**

Agricultural and forest lands are valued in accordance with administrative rules adopted by the Department of Revenue in Title 42, Chapter 20. Use changes are updated annually on both agricultural and forest lands. For agricultural land the valuation methodology and agricultural land valuation schedules are developed in accordance with 15-7-201, MCA. For forest land the valuation methodology and forest land valuation schedules are developed in accordance with 15-44-103, MCA. The agricultural and forest lands values will reflect productivity values in accordance with 15-7-201 and 15-44-103, MCA.

The appraisal of agricultural/forest lands consists of field reviews of agricultural/forest lands improvements; agricultural/forest lands property data collection and analysis; the data entry of agricultural/forest lands information; and final determinations of value. The plan provides for multiple field reviews of each property to be kept to an absolute minimum.

The appraisal plan provides for field reviews. A field review consists of an external observation to determine accuracy of existing

information on the property record card; to review agricultural and forest lands classification, and to collect additional data required to implement PVAS. No callbacks will be made to the property unless specifically requested by the taxpayer or the department.

Agricultural/forest lands property data entry consists of correcting, updating, and adding agricultural/forest lands property data to the Department of Revenue's PVAS. The correction, updating and addition process also consists of reviewing edit reports which result from that process, the manual entry of agricultural/forest lands information to (out-buildings and residences) to PVAS.

Property Record Cards are generated and reviewed by appraisal staff. They include physical characteristic and component information for agricultural/forest lands, productivity information, basic ownership information, and valuation information. The review consists of reviewing productivity information on agricultural/forest lands. This review allows the appraiser to compare property information to an estimate of value. Discrepancies in data or the collection of additional information required by the review will result in the update of data on PVAS. The addition or refinement of existing data results in a more accurate valuation estimate.

Final determinations of value are conducted once all required field and program needs of PVAS are met. The appraised value for agricultural/forest lands includes an estimate of productive value.

The results of this rule apply to tax years beginning January 1, 2009, and extending through December 31, 2014. All property is appraised at the market value as of July 1, 2008.

## **2009 INDUSTRIAL PROPERTY REAPPRAISAL**

Industrial properties are appraised by industrial appraisers and the resulting appraised values are distributed to the appropriate local department field office.

The appraisal plan provides for industrial property to be valued as an entity; that is to say, the valuation includes both real and personal property valuation. For valuation methodology, the department will rely upon ARM 42.22.1304 through 42.22.1310. The department will be responsible for valuing industrial property as that concept is defined in ARM 42.22.1301, 42.22.1302, and 42.22.1303.

The results of this rule apply to tax years beginning January 1, 2009, and extending through December 31, 2014.

## **CERTIFICATION AND TRAINING REQUIREMENTS**

Residential and commercial appraisers are required to be certified. The department will develop policies and procedures outlining certification requirements that meet the IAAO standards. (ARM 42.18.120)

## **VALUATION MANUALS**

For the reappraisal cycle ending December 31, 2014, the 2009 Montana Appraisal Manual will be used for valuing residential, commercial and industrial real property if the property is listed. Other construction cost manuals such as Marshall & Swift; Richardson Engineering Services, Inc.; or R.S. Means Company, Inc. may be used with a publication date as close as possible to the Montana Appraisal Manual. The cost base schedules will reflect July 1, 2008 cost information.

## **CLARIFICATION OF VALUATION PERIODS**

In compliance with 15-7-103(5), MCA:

For the taxable years from January 1, 1986, through December 31, 1992, all property classified in 15-6-134, MCA (Class 4), must be appraised at its market value as of January 1, 1982.

For the taxable years from January 1, 1993, through December 31, 1996, all property classified in 15-6-134, MCA, (Class 4) must be appraised at its market value as of January 1, 1992.

For the taxable years from January 1, 2003, through December 31, 2008, all property classified in 15-6-134, MCA (Class 4) must be appraised at its market value as of January 1, 2002.

For the taxable years from January 1, 2009, through December 31, 2014, all property classified in 15-6-134, MCA (Class 4), must be appraised at its market value as of July 1, 2008.

# PART TWO: APPRAISAL THEORY

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## RIGHTS AND THE PRINCIPLES OF VALUE

An appraisal is an opinion or estimate of value. It is the appraiser's responsibility to determine, through the appraisal process, the full market value of the property as of the appraisal date.

This section concerns itself with those concepts and principles basic to the property valuation process.

## BUNDLE OF RIGHTS

Real estate and real property are often used interchangeably. Generally speaking, real estate pertains to the real or fixed improvements to the land such as structures and other appurtenances, whereas real property encompasses all the interests, benefits and rights enjoyed by the ownership of the real estate.

Real property ownership involves the Bundle of Rights Theory that asserts that the owner has the right to enter it, use it, sell it, lease it, or give it away, as he so chooses. These rights are guaranteed by law, but they are subject to certain governmental and private restrictions.

The Governmental restrictions are found in its power to:

tax property.

take property by condemnation for the benefit of the public, providing that just compensation is made to the owner (Eminent Domain).

police property by enforcing any regulations

deemed necessary to promote the safety, health, morals and general welfare of the public.

provide for the reversion of ownership to the state in cases where a competent heir to the property cannot be ascertained (Escheat).

Private restrictions imposed upon property are often in the form of agreements incorporated into the deed. The deed also spells out precisely which rights of the total bundle of rights the buyer is acquiring. Since value is related to each of these rights, the appraiser should know precisely which rights are involved in his appraisal.

Appraisals for Ad Valorem tax purposes generally assume the property is owned in the "Fee Simple," meaning that the total bundle of rights is considered to be intact.

## THE NATURE AND MEANING OF VALUE

For Ad Valorem Tax purposes, the value sought is generally market value. The descriptive term "market" indicates the activity of buyers and sellers. **MARKET VALUE** is the justifiable price, or the price which an informed and intelligent buyer, fully aware of the existence of competing properties, and not being compelled to act, would be justified in paying for a particular property.

## VALUE IN USE AS OPPOSED TO VALUE IN EXCHANGE

A property is said to have value in use when no market value for such exists. The value in use refers to the actual value of a commodity to a specific person, as opposed

to value in exchange. Value in exchange refers to the dollar value of a commodity to buyers in general.

## **THE PRINCIPLE OF SUPPLY AND DEMAND**

Among the forces which constantly operate to influence supply and demand are population growth, new techniques in transportation, purchasing power, price levels, wage rates, taxation, governmental controls, and scarcity. A sudden population growth in an area would create an increase in demand for housing. If the demand increased at a higher rate than the supply, there could soon be a scarcity of housing. If the demand was backed up by purchasing power, rentals and sale prices would tend to increase and ultimately reach a level that would tend to stimulate more builders to compete for the potential profits and thus serve to increase the supply toward the level of demand. As the supply is increased demand would begin to taper off. This would cause rentals and sale prices to level off. When builders, due to increases in labor and materials rates, are no longer able to build cheaply enough to meet the new level of prices and rents, competition would tend to taper off and supply would level off. The cycle is then complete.

Balance occurs when reasonable competition serves to coordinate supply with demand. When competition continues unchecked to produce a volume which exceeds the demand, the net returns to investors are no longer adequate to pay all the costs of ownership, resulting in loss rather than profit and consequently, a decline in values.

A community may support two shopping centers, but the addition of a third shopping center may increase the supply to an excess. If this occurs, one of two effects are caused; either the net dollar return to all the shop-

ping centers will be reduced below that level necessary to support the investment, or one of the shopping centers will flourish at the others' expense.

## **THE PRINCIPLE OF HIGHEST AND BEST USE**

The highest and best use for a property is the use that will produce the highest net return to the land for a given period of time within the limits of those uses which are economically feasible, probable, and legally permissible.

## **THE PRINCIPLE OF CHANGE**

The impact of change on the value of real property manifests itself in the life cycle of a neighborhood. The cycle is characterized by three stages of evolution: the development and growth evidenced by improving values; the leveling off stage evidenced by static values; and finally, the stage of infiltration of decay evidenced by declining values.

## **THE PRINCIPLE OF SUBSTITUTION**

Value is created by people in the market place. It is the function of translating demand into a commodity of exchange. When the benefits and advantages derived from two properties are equal, the lowest priced property receives the greatest demand. The informed buyer is not justified in paying anything more for a property than it would cost to acquire an equally desirable property. That is to say that the value of a property is established as that amount for which equally desirable comparable properties are being bought and sold in the market. Herein lies an approach to value and the basis of the valuation process.

## TRADITIONAL APPROACHES TO VALUE

It is the appraiser's job to define the type of value sought, to compile and to analyze all related data, and give consideration to all the factors which may influence the value, and to process and translate that data into a final opinion or estimate of value. This must be done for each property appraised.

The processing of this data into a conclusion of value generally takes the form of three recognized approaches to value: Cost, Sales Comparison, or Income. Underlying each of the approaches is the principle that the justifiable price of a property is no more than the cost of acquiring and/or reproducing an equally desirable substitute property. The use of one or all three approaches in the valuation of a property is determined by the quantity, quality, and accuracy of the data available to the appraiser.

**COST APPROACH** involves making an estimate of the depreciated cost of reproducing or replacing the building and site improvements. Reproduction Cost refers to the cost at a given point in time of reproducing a replica property, whereas Replacement Cost refers to the cost of producing improvements of equal utility. Depreciation is deducted from this cost new for loss in value caused by physical deterioration, and functional or economic obsolescence. To this depreciated cost is added the estimated value of the land, resulting in an indication of value derived by the Cost Approach.

The significance of the Cost Approach lies in its extent of application. It is the one approach that can be used on all types of construction. It is a starting point for appraisers, and therefore it is a very effective "yardstick" in any equalization program for Ad Valorem taxes. Its widest application is in the

appraisal of properties where the lack of adequate market and income data preclude the reasonable application of the other traditional approaches.

**SALES COMPARISON APPROACH** involves the compiling of sales of properties that are comparable to the property being appraised. These sales and offerings are then adjusted for any dissimilarities, and a value range obtained by comparison of said properties. The approach is reliable to the extent that the properties are comparable, and the appraiser's judgment of proper adjustments is sound. The procedure for using this approach is essentially the same for all types of property with the only difference being the elements of comparison.

The significance of this approach lies in its ability to produce estimates of value which directly reflect the status of the market. Its application is contingent upon the availability of comparable sales, and therefore finds its widest range in the appraisal of vacant land and residential properties.

**INCOME APPROACH** measures the present worth of the future benefits of a property by the capitalization of the net income stream over the remaining economic life of the property. The approach involves making an estimate of the "effective gross income" of a property, derived by deducting the appropriate vacant and collection losses from its estimated economic rent, as evidenced by the yield of comparable properties. From this figure then are deducted applicable operating expenses, insurance, and reserve allowances for replacements resulting in an estimate of net income, which may then be capitalized into an indication of value.

The approach obviously has its basic application in the appraisals of properties universally bought and sold on their ability

to generate and maintain a stream of income for their owners. The effectiveness of the approach lies in the appraiser's ability to relate to the changing economic environment and to analyze income yields in terms of their relative quality and durability.

## **PROPERTY VALUATION TECHNIQUES**

### **APPLYING THE COST APPROACH**

Estimating the value of the land and adding the land value to the depreciated value of the structures on the land will result in a valid indication of value.

Estimated Land Value + Estimated Replacement Cost New of Structures – Estimated Depreciation = Indication of Property Value

Since estimating the land value is covered in a separate section, this section will cover Replacement Cost and Depreciation.

### **REPLACEMENT COST**

Replacement Cost is the current cost of producing an improvement of equal utility to the subject property; it may or may not be the cost of reproducing a replica property. It is not to be confused with Reproduction Cost, which refers to a substitute replica property. In a particular situation the two concepts may be interchangeable, but they are not necessarily so. They both, however, have application in the Cost Approach to value, the difference being reconciled in the consideration of depreciation allowances.

In actual practice, outside of a few historic type communities in this country, developers and builders, for obvious economic reasons, replace buildings, not reproduce

them. It logically follows that if an appraiser's job is to measure the actions of knowledgeable persons in the market place, the use of proper replacement costs should provide an accurate starting point in the valuation of most improvements.

The replacement cost includes the total cost of construction incurred by the builder whether preliminary to, during the course of, or after completion of the construction of a particular building. Among these are material, labor, all subcontracts, builders' overhead and profit, architectural and engineering fees, consultation fees, survey and permit fees, legal fees, taxes, insurance, and the cost of interim financing.

### **ESTIMATING REPLACEMENT COST**

There are various methods that may be employed to estimate replacement cost new. The methods widely used in the appraisal field are the quantity survey method, the unit in place or component part in place method, and the model method.

The Quantity Survey Method involves a detailed itemized estimate of the quantities of various materials used, labor and equipment requirements, architect and engineering fees, contractor's overhead and profit, and other related costs. This method is primarily employed by contractors and cost estimators for bidding and budgetary purposes and is much too labor intensive and costly to be effective in every day appraisal work, especially in the mass appraisal field. The method, however, does have its place in that it is used to develop certain unit in place costs which can be more readily applied to estimating for appraisal purposes.

The Unit in Place Method is employed by establishing in place cost estimates (including material, labor, overhead and profit) for

various structural components. The prices established for the specified components are related to their most common units of measurement such as cost per yard, cost per lineal foot, and cost per square foot.

The unit prices can then be multiplied by the respective quantities of each as they are found in the composition of the subject building to derive the whole dollar component cost, the sum of which is equal to the estimated cost of the entire building, providing of course, that due consideration is given to all other indirect costs, which may be applicable.

This component part in place method of using basic units can also be extended to establish prices for larger components in place such as complete structural floors (including the finish flooring, sub floor, joists and framing) which are likely to occur repeatedly in a number of buildings.

The Model Method is still a further extension, in that Unit in Place costs are used to develop base unit square foot or cubic foot costs for total specified representative structures in place, which may then serve as “models” to derive the base unit cost of comparable structures to be appraised. The base unit cost of the model most representative of the subject building is applied to the subject building and appropriate tables of additions and deductions are used to adjust the base cost of the subject building to account for any significant variations between it and the model.

Developed and applied properly, these pricing techniques will assist the appraiser in arriving at valid and accurate estimates of replacement cost new as of a given time. That cost generally represents the upper limit of value of a structure. The difference between its replacement cost new and its present val-

ue is depreciation. The final step in completing the Cost Approach then is to estimate the amount of depreciation and deduct it from the replacement cost new.

## DEPRECIATION

Simply stated, depreciation can be defined as “a loss in value from all causes.” As applied to real estate, it represents the loss in value between market value and the sum of the replacement cost new of the improvements plus the land value as of a given time. The causes for the loss in value may be divided into three broad classifications: Physical Deterioration, Functional Obsolescence, and Economic Obsolescence.

Physical Deterioration pertains to the wearing out of the various building components, referring to both short life and long life terms, through the action of the elements, age, and use. The condition may be considered either “curable” or “incurable,” depending upon whether it may or may not be practical and economically feasible to cure the deficiency by repair and replacement.

Functional Obsolescence is a condition caused by either inadequacies or over adequacies in design, style, composition, or arrangement inherent to the structure itself, which tends to lessen its usefulness.

Total accrued depreciation may be derived by first estimating the total useful life of a structure and then translating its present condition, desirability, and usefulness into an effective age (rather than an actual age) which would represent that portion of its total life (percentage) which has been used up. The Effective Age is then subtracted from the base year to arrive at the Effective Year.

Like physical deterioration, the condition may be considered either curable or incur-

able. Some of the more common examples of functional obsolescence are excessive wall and ceiling heights, excessive structural construction, surplus capacity, ineffective layouts, and inadequate building services.

Economic Obsolescence is a condition caused by factors extraneous to the property itself, such as changes in population characteristics and economic trends, encroachment of inharmonious land uses, excessive taxes, and governmental restrictions. The condition is generally incurable in that the causes lie outside the property owner's realm of control.

## **ESTIMATING DEPRECIATION**

An estimate of depreciation represents an opinion of the appraiser as to the degree that the present and future appeal of a property has been diminished by deterioration and obsolescence. Of the three estimates necessary to the cost approach, it is the one most difficult to make. The accuracy of the estimate will be a product of the appraiser's experience in recognizing the symptoms of deterioration and obsolescence and the ability to exercise sound judgment in equating all observations to the proper monetary allowance to be deducted from the replacement cost new. There are several acceptable methods which may be employed:

Physical deterioration and/or functional obsolescence can be measured by observing and comparing the physical condition and/or functional deficiencies of the subject property as of a given time with either an actual or hypothetical, comparable, new and properly planned structure.

Curable physical deterioration and functional obsolescence can be measured by estimating the cost of restoring each item of depreciation to a physical condition as good

as new, estimating the cost of eliminating the functional deficiency.

Functional and economic obsolescence can be measured by capitalizing the estimated loss in rent due to the structural deficiency or lack of market demand.

Total accrued depreciation may also be estimated by deriving the amount of depreciation recognized by the purchase price of the property; the loss of value being the difference between the cost of replacing the structure new and its actual selling price (total property selling price less the estimated value of the land).

## **APPLYING THE SALES COMPARISON APPROACH**

An indication of the value of a property can be derived by analyzing the selling prices of comparable properties. The use of this technique, often referred to as the "comparison approach" or "comparable sales approach," involves the selection of a sufficient number of valid comparable sales and the adjustment of each sale to the subject property to account for variations in time, location, site and structural characteristics.

## **SELECTING VALID COMPARABLES**

Since market value has been defined as the price which an informed buyer, fully aware of the existence of competing properties and not being compelled to act is justified in paying for a particular property, it follows that if market value is to be derived from analyzing comparable sales, that the sales must represent valid "arm's length" transactions. Due consideration must be given to the conditions and circumstances of each sale before selecting the sales for analysis. Some examples of sales which do not normally reflect valid market conditions are as follows:

Sales in connection with foreclosures, bankruptcies, condemnations and other legal action.

Sales to or by federal, state, county and local governmental agencies.

Sales to or by religious, charitable or benevolent tax exempt agencies.

Sales involving family transfers, or “love and affection.”

Sales involving intra-corporate affiliations.

Sales involving the retention of life interests.

Sales involving cemetery lots.

Sales involving mineral or timber rights, and access or drainage rights.

Sales involving the transfer of part interests.

In addition to selecting valid market transactions, it is equally important to select properties which are truly comparable to the property under appraisal. The comparables and subject properties must exhibit the same use, and the site and structural characteristics must exhibit an acceptable degree of comparability.

## **PROCESSING COMPARABLE SALES**

All comparables must be adjusted to the subject property to account for variations in time and location. The other major elements of comparison will differ depending upon the type of property being appraised. In selecting these elements, the appraiser must give prime consideration to the same factors that influence the prospective buyers of particular types of properties.

The typical home buyer is interested in the property’s capacity to provide the family with a place to live. A primary concern is with the living area, utility area, number of rooms, number of baths, age, structural quality and condition, the presence of a modern kitchen and recreational conveniences of the house. Equally important is the location and neighborhood, including the proximity to and the quality of schools, public transportation, and recreational and shopping facilities.

The typical buyer of commercial property, including warehouses and certain light industrial plants, is primarily concerned with its capability to produce revenue. Of special interest will be the age, design and structural quality and condition of the improvements, the parking facilities, and the location relative to transportation, labor markets and trade centers.

In applying the sales comparison approach to commercial/industrial property, the appraiser will generally find it difficult to locate a sufficient number of comparable sales, especially for properties which are truly comparable in their entirety. It will, therefore, generally be necessary to select smaller units of comparison such as price per square foot, per unit, per room, etc. In doing so, great care must be exercised in selecting a unit of comparison that represents a logical common denominator for the properties being compared. Using such units of comparison enables the appraiser to compare two properties which are similar in use and structural features, but differ significantly in size and other characteristics.

Having selected the major factors of comparison, it remains for the appraiser to adjust each of the factors to the subject property. In comparing the site, adjustments for size, location, accessibility, and site improvements must be made. In comparing the

structures, adjustments for size, quality, design, condition, and significant structural and mechanical components also must be made. The adjusted selling prices of the comparable properties will establish a range in value in which the value of the subject property will fall. Further analysis of the factors should enable the appraiser to narrow the range down on the value level which is most applicable to the subject property.

## **APPLYING THE INCOME APPROACH**

### **INTRODUCTION**

The justified price paid for income producing property is no more than the amount of investment required to produce a comparably desirable return. Since the market can be analyzed in order to determine the net return actually anticipated by investors, it follows that the value of income producing property can be derived from the income which it is capable of producing. An estimate of income is required – through the collection and analysis of available economic data, the development of a property capitalization rate, and the processing of the net income into an indication of value by employing one or more of the acceptable capitalization methods and techniques.

### **THE PRINCIPLES OF CAPITALIZATION**

Capitalization is the process for converting the net income produced by property into an indication of value. Through the years of appraisal history, a number of procedures have been recognized and employed by appraisal authorities in determining the value of real estate by the income approach. Although present day practice recommends only certain methods, we will touch on the other approaches to value.

## **EXPLORING THE RENTAL MARKET**

The starting point for the appraiser is an investigation of current economic rent in a specific area in order to establish a sound basis for estimating the gross income that should be returned from competitive properties. The appraiser must make a distinction between economic rent or the rent which property is normally expected to produce on the open market, as opposed to control rent or the rent which property is actually realizing at the time of the appraisal due to lease terms established sometime in the past.

The first step then is to obtain specific income and expense data on properties which best typify normal market activity. The data is necessary to develop local guidelines for establishing the economic rent and related expenses for various types of properties.

The next step is to similarly collect income and expense data on individual properties, and to evaluate the data against the established guidelines.

The collection of income and expense (I & E) data is an essential phase in the valuation of commercial properties. The appraiser is primarily concerned with the potential earning power of the property. The objective is to estimate its expected net income. Income and expense statements of past years are valuable only to the extent which they serve this end. Consideration of the following factors should assist the appraiser in evaluating the I & E data in order to arrive at an accurate and realistic estimate of net income.

### **QUESTIONS RELATING TO INCOME DATA**

Was the reported income produced entirely by the subject property? Very often the

rental will include an amount attributable to one or more additional parcels of real estate. In this case, it would be necessary to obtain the proper allocations of rent.

Was the income attributable to the subject property as it physically existed at the time of the appraisal, or did the appraisal include the value of leasehold improvements and remodeling for which the tenant paid in addition to rent? If so, it may be necessary to adjust the income to reflect economic rent.

Does the reported income represent a full year's return? It is often advisable to obtain both monthly and annual amounts as a cross check.

Does the income reflect current economic rent? Is part or all of the income predicated on old leases? If so, what are the provisions for renewal options and rates?

Does the reported income reflect 100% occupancy? What percentage of occupancy does it reflect? Is this percentage typical of this type of property, or is it due to special nonrecurring causes?

Does the income include rental for all marketable space? Does it include an allowance for space, if any, which is either owner or manager occupied? Is the allowance realistic?

Is the income attributable directly to the real estate and conventional amenities? Is some of the income derived from furnishings and appliances? If so, it will be necessary to adjust the income or make provisions for reserves to eventually replace them, whichever local custom dictates.

In many properties, an actual rental does not exist because the real estate is owner occu-

ped. In this event it is necessary to obtain other information to provide a basis to estimate economic rent. The information required pertains to the business operation using the property. Proper analysis of the annual operating statements, including gross sales or receipts, can provide an accurate estimate of economic rent. Information requirements for a few of the more common property uses are as follows:

**Retail Stores:** The annual net gross sales. (Gross sales less returned merchandise)

**Hotels and Motels:** The annual operating statement. If retail or office space is leased in these properties, obtain the actual rent paid.

**Theaters:** The annual gross receipts (including admissions and concessions) and seating capacity.

**Automobile Parking:** The annual gross receipts.

## ANALYSIS OF EXPENSE DATA

The appraiser must consider only those expenses which are applicable to the cost of ownership; that is, those expenses which are normally owner incurred. Any portion of the expenses incurred directly or indirectly by the tenant should not be considered. Each expense item must stand the test of both legitimacy and accuracy. How do they compare with the established guidelines and norms? Are they consistent with the expenses incurred by comparable properties?

Management refers to the cost of administration. These charges should realistically reflect what a real estate management company would actually charge to manage the property. If no management fee is shown on the statement, a proper allowance must be

made by the appraiser. On the other hand, if excessive management charges are reported, as is often the case, the appraiser must disregard the reported charges and use an amount which he deems appropriate and consistent with comparable type properties. The cost of management bears a relationship with the risk of ownership and will generally range between 4 to 10% of the gross income.

**General expenses** may include such items as the cost of services and supplies not charged to a particular category. Unemployment and F.I.C.A. taxes, Workmen's Compensation, and other employee insurance plans are usually legitimate deductions when employees are a part of the building operation.

**Reimbursed expenses** refer to the cost associated with the maintenance of public or common areas of the commercial property. This expense is passed on to the tenants and should, therefore, only be considered when the amount of reimbursement is included as income. Miscellaneous expenses are the "catch all" category for incidentals. This item should reflect a very nominal percentage of the income. If expenses reported seem to be excessive, the appraiser must examine the figures carefully in order to determine if they are legitimate expenses and if so, to allocate them to their proper category.

**Cleaning expenses** are legitimate charges. They can be for such items as general housekeeping and maid service, and include the total cost of labor and related supplies. All or a portion of the cleaning services may be provided by outside firms working on a "contract" basis. Cleaning expenses vary considerably and are particularly significant in operations such as offices and hotels. "Rule of thumb" norms for various operations are made available through national management associations. The appraiser

should have little difficulty in establishing local guidelines.

**Utilities** are generally legitimate expenses and if reported accurately, need very little reconstruction by the appraiser, other than to determine if the charges are consistent with comparable properties. Local utility companies can provide the appraiser with definition guidelines.

**Heat and Air Conditioning costs** are often reported separately and in addition to utilities. The expenses would include the cost of fuel other than the above-mentioned utilities, and may include, especially in large installations, the cost of related supplies, inspection fees, and maintenance charges. These are generally legitimate costs, and the same precautions prescribed for "utilities" are in order.

**Elevator expenses**, including the cost of repairs and services, are legitimate deductions, and are generally handled through service contracts. These fees can generally be regarded as fairly stable annual recurring expenses.

**Decorating and minor alterations** are necessary to maintain the income stream of many commercial properties. In this respect they are legitimate expenses. However, careful scrutiny of these figures is required. Owners tend to include the cost of major alterations and remodeling which are, in fact, capital expenditures, and as such are not legitimate operating expenses.

**Repairs and Maintenance expenses** reported for any given year may not necessarily be a true indication of the average or typical annual expense for these items. For example, a statement could reflect a substantial expenditure for a specific year (possibly because the roof was replaced and/or several

items of deferred maintenance were corrected); yet the statement for the following year may indicate that repairs and maintenance charges were practically nil. It is necessary for the appraiser to either obtain complete economic history on each property in order to make a proper judgment as to the average annual expense for these items, or include a proper allowance based on norms for the type and age of the improvements to cover annual expenses. Since it is neither possible nor practical to obtain enough economic history on every property, the latter method is generally used and the amounts reported for repairs and maintenance are then estimated by the appraiser.

**Insurance:** Caution must be used in accepting insurance expense figures. Cost shown may be for more than one year, or may be for blanket policies including more than one building. It is generally more effective for appraisers to establish their own guidelines for insurance. They must also be careful to include only items applicable to the real estate. Fire extended coverage and owner's liability are the main insurance expense items. Separate coverages on special component parts of the buildings, such as elevators and plate glass, are also legitimate expenses.

**Real Estate Taxes:** In making appraisals for tax purposes, the appraiser must exclude the actual amount reported for real estate taxes. Since future taxes will be based on the appraised value, the appraiser must express the taxes as a factor of the estimated value. This can be done by including an additional percentage in the capitalization rate to account for real estate taxes.

**Depreciation:** The figure shown for depreciation on an operating statement is a "bookkeeping figure" which the owner uses for Internal Revenue purposes and should not

be considered in the income approach. This reflects a tax advantage which is one of the benefits of ownership.

**Interest:** Although interest is considered a legitimate expense, it is always included in the Capitalization Rate. Most property is appraised as if it were "free and clear"; however, the appraiser does consider the interest of a current mortgage in the Capitalization Rate build-up.

**Land Rent:** When appraising for real estate tax purposes, only the sum of the leasehold and the leased fee is usually considered. Land rent is not deducted as an expense. Considered separately, rent from a ground lease would be an expense to the leasehold interest and an income to the leased fee. However, if land were rented from another property to supply additional parking for example, that land rent would be an allowable expense.

It is obvious that there are some expense items encountered on operating statements that appraisers should not consider as allowable. This is because they are interested in legitimate cash expenses only. Income statements are usually designed for income tax purposes where credit can be taken for borrowing costs and theoretical depreciation losses.

It is virtually impossible and certainly not always practical to obtain a complete economic history on every commercial property being appraised. On many properties, however, detailed economic information can be obtained through the use of income and expense forms. One must realistically recognize the fact that the data obtainable on some properties is definitely limited.

In most cases, the gross income and a list of the services and amenities furnished can

be obtained during the data gathering operation. However, in order to insure a sound appraisal, it may be necessary to estimate the fixed and operating expenses. This is best accomplished by setting guidelines for expenses, based on a percent of Effective Gross Income or a cost per square foot of leasable area. These percentages or costs will vary depending on the services supplied and the type of property.

## CAPITALIZATION METHODS

The most prominent methods of capitalization are Direct, Straight Line, Sinking Fund, and Annuity. Each of these is a valid method for capitalizing income into an indication of value. The basis for their validity lies in the action of the market, which indicates that the value of income producing property can be derived by equating the net income with the net return anticipated by informed investors. This can be expressed in terms of a simple equation:

$$\text{Value} = \frac{\text{Net Income Value}}{\text{Capitalization Rate}}$$

The Straight Line and Sinking Fund methods are both actual forms of Straight Capitalization, with one using Straight Line recapture and the other using Sinking Fund recapture. Both methods follow the same basic principles as Direct Capitalization, differing only in that they provide for separate capitalization rates for land and building; the building rate differing from the land rate in that it includes an allowance for recapture.

**Straight Line Capitalization** allows for “recapture” based on remaining economic life of the building implying that at the end of that period of time, there would be a zero improvement value. There are three fallacies in this thinking. First, the potential buyer

(investor) has no intention of holding the property that long. The average investment period might average ten years. Second, the investor anticipates that at the end of that period he will either get all his money back or will make a profit. And third, is the depreciation allowance possible in connection with federal income taxes.

Depreciation allowances begin to “run out” between seven and ten years, so the advantages of owning the property are reduced considerably. A prudent owner may choose to sell the property at this point and re invest in another property so that he may begin the depreciation cycle again and continue to take full advantage of the favorable tax laws.

For these reasons, the Straight Line Capitalization Method does not usually follow what the market indicates.

Straight Line recapture calls for the return of investment capital in equal increments or percentage allowances spread over the estimated remaining economic life of the building.

**Sinking Fund** recapture calls for the return of invested capital in one lump sum at the termination of the estimated remaining economic life of the building. This is accomplished by providing for the annual return of a sufficient amount needed to invest and annually re invest in “safe” interest bearing accounts, such as government bonds or certificates of deposit, which will ultimately yield the entire capital investment during the course of the building’s economic life. Annuity Capitalization lends itself to the valuation of long term leases. In this method, the appraiser determines, by the use of annuity tables, the present value of the right to receive a certain specified income over a stipulated duration of the lease. In addition to the value of the income stream, the appraiser

must also consider the value that the property will have once it reverts back to the owner at the termination of the lease. This reversion is valued by discounting its anticipated value against its present day worth. The total property value then is the sum of the capitalized income stream plus the present worth of the reversion value.

## CURRENT TECHNIQUES

There are two methods, however, that do lend themselves to an accurate measure of market value based on potential income. These are Direct Capitalization, utilizing the Direct Comparison Method of Rate Selection, and Mortgage Equity Capitalization.

### DIRECT CAPITALIZATION

In Direct Capitalization, the appraiser determines a single “overall” capitalization rate. This is done by analyzing actual market sales of similar types of properties. He develops the net income of each property, and divides the net income by the sales price to arrive at an overall rate to provide an indication of value.

### MORTGAGE EQUITY CAPITALIZATION

Mortgage Equity Capitalization is a form of direct capitalization with the major difference in the two approaches being the development of the overall capitalization rate.

In this method, equity yields and mortgage terms are considered influencing factors in construction of the interest rate. In addition, a plus or minus adjustment is required to compensate for anticipated appreciation or depreciation. This adjustment can be related to the recapture provisions used in other capitalization methods and techniques.

## RESIDUAL TECHNIQUES

It can readily be seen that any one of the factors of the Capitalization Equation (Value = Net Income divided by Capitalization Rate) can be determined if the other two factors are known. Furthermore, since the value of property is the sum of the land value plus the building value, it holds that either of these can be determined if the other is known. The uses of these mathematical formulas in capitalizing income into an indication of value are referred to as the residual techniques, or more specifically, the property residual, the building residual, and the land residual techniques.

The Property Residual Technique is an application of Direct Capitalization. In this technique, the total net income is divided by an overall capitalization rate (which provides for the return on the total investment) to arrive at an indicated value for the property. This technique has received more popular support in recent years because it closely reflects the market. With this technique, the capitalization rate may be developed by either “direct comparison” in the market or by the Mortgage Equity Method.

The Building Residual Technique requires the value of the land to be a known factor. The amount of net income required to earn an appropriate rate of return on the land investment is deducted from the total net income. The remainder of the net income (residual) is divided by the building capitalization rate.

Note that the “constant annual percent” is used for the rate of the loan.

Since there is a gain in equity’s position through the years by the loan being paid off little by little, it is necessary to calculate the credit for “Equity Build-Up.”

The Lands Residual Technique requires the value of the building to be a known factor. The amount of net income required to provide both a proper return on and the recapture of the investment is deducted from the total net income. The remainder of the net income (residual) is then divided by the land capitalization rate (which is composed of a percentage for the return on the investment, plus an effective tax rate) to arrive at an indicated value for the land.

## MORTGAGE EQUITY METHOD EXAMPLE

For purposes of illustration, assume an investment financed with a 70% loan at 14.0% interest. The term of the mortgage is 20 years, paid off in level monthly payments. The total annual cost for principal and interest on such a loan can be determined by referring to the mortgage equity tables. Select the Constant Annual percent for an interest rate of 14.0% and a term of 20 years. Note that the constant is 14.92% of the amount borrowed, or .92% more than the interest rate alone.

Assume that the equity investor will not be satisfied with less than an 18% yield. The income necessary to satisfy both Lender and Equity can now be shown. The product of the percent portion and the rate equals the weighted rate. The total of each weighted rate equals the weighted average.

	Weighted Portion Rate	Mortgage Loan Rate	
(principal interest)	70%	.1492	= .1044

Only a portion of the principal will be paid off and this amount must be discounted, as it won't be received for ten years. From the Table of Loan Balance and Debt Reduction, at the end of ten years for a 20-year mortgage at 14%, the figure is 0.199108.

Consulting the sinking fund tables indicates that the discount factor for 18% and 10 years is .0425.

The credit for Equity Buildup can now be deducted from the basic rate, thus: (% of loan paid in 10 yrs.) x (loan rate) x (sinking fund 18% for 10 yrs.)

Weighted Average	.1584
.199108 x 70% x .0425	<u>-.0059</u>
Resulting Net Rate	= .1525

## LAND VALUATION TECHNIQUES

In making appraisals for Ad Valorem Tax purposes, it is generally necessary to estimate separate values for the land and the improvements on the land. In actuality, the two are not separated and the final estimate of the property as a single unit must be given prime consideration. However, in arriving at that final estimate of value, aside from the requirements for property tax appraisals, there are certain other reasons for making a separate estimate of value for the land:

An estimate of land value is required in the application of the Cost Approach.

An estimate of land value is required to be deducted from the total property selling price in order to derive indications of depreciation through market data analysis. (Depreciation being equal to the difference between the replacement cost new of a structure and the actual price paid in the market place for the structure.)

As land is not a depreciable item, a separate estimate of land value is required for bookkeeping and accounting purposes; likewise, the total capitalization rate applicable to land will differ from the rate applicable to the improvements on the land.

Since land may or may not be used to its highest potential, the value of land may be completely independent of the existing improvements on the land.

As appraiser's opinions are based on data derived from the market, it is necessary to study and adapt, if possible, procedures used by those closest to everyday transactions.

## COMPARABLE SALES METHOD

The most frequently used method in estimating the value of land is the comparable sales method in which land values are derived from analyzing the selling prices of similar sites. This method is in essence the application of the market data approach to value and all the considerations pertaining thereto are equally applicable here.

The appraiser must select comparable and valid market transactions, and must weigh and give due consideration to all the factors significant to value, adjusting each to the subject property. The comparable sites must be used in the same way as is the subject property, and subjected to the same zoning regulations and restrictions. It is also preferable, whenever possible, to select comparables from the same or a similar neighborhood. The major adjustments will be to account for variations in time, location, and physical characteristics to include size, as well as other factors which may significantly influence the selling price.

Although it is always preferable to use sales of unimproved lots for comparables, it is not always possible to do so. Older neighborhoods are not likely to yield a sufficient number of representative sales of unimproved lots to permit a valid analysis. In such cases, in order to arrive at an estimate of land values using the comparable sales approach,

it is necessary to consider improved property sales and to estimate the portion of the selling price applicable to the structure. The procedure would be to estimate the replacement cost of the buildings as of the date of sale, estimate the accrued depreciation and deduct that amount from the replacement cost. The resulting estimated selling price of the buildings can be deducted from the total selling price of the property to derive the portion of the selling price which can be allocated to the land. The equation is as follows:

$$S - V_B = V_L$$

where:

S = Selling Price of Property

$V_B$  = Estimated Depreciated Value of Buildings

$V_L$  = Indication of Land Value

In some older neighborhoods, vacant lots will exist often as a result of fire or normal deterioration. Since the desirability as a new building site is restricted, value is generally determined by adjoining property owners who have a desire for additional land area.

In order to apply the comparable sales method, it is first necessary to establish a common unit of comparison. The units generally used in the valuation of land are price per front foot, square foot or acre. The selection of any one particular unit depends upon the type of property being appraised. Frontage may be used for platted, uniform type residential lots, and square footage and acreage for larger, unplatted tracts, as well as irregularly shaped lots lacking in uniformity. Use of square footage is especially desirable in Central Business Districts where the entire lot maintains the same level of value: depth factor adjustments have a tendency to distort this concept. Commercial arteries are also best valued on a square foot basis.

The utility of a site will vary with the frontage, width, depth, and overall area. Similarly, the unit land values should be adjusted to account for differences in size between the comparables and the subject property. Since such an adjustment is generally necessary for each lot, it is beneficial that the appraiser adopt and/or develop standardized procedures for adjusting the lot size and the unit values to account for the variations. It is not uncommon for all lots within a development to market at the same price. Should data indicate this, it is necessary to make alterations or adjustments to maintain this value level. In some cases, a “site value” concept has advantages. Some of the techniques commonly employed are:

Standard lot sizing techniques provide for the adjustment of the frontage, width, and depth of irregular shaped lots to make the units of measurement more comparable with uniform rectangular lots.

Standard Depth Tables provide for the adjustment of front foot unit values to account for variations in depth from a predetermined norm.

Frontage Tables provide for the adjustment of front footage unit values to account for variations in the relative utility value of excessive or insufficient frontage as compared to a predetermined norm.

Acreage or Square Footage Tables provide for the adjustment of unit values to account for variations in the relative utility value of excessive or insufficient land sizes as compared to a predetermined norm.

During the process of adjusting the comparable sales to account for variations between them and the subject property, the appraiser must exercise great care to include

all significant factors and to properly consider the impact of each of the factors upon the total value.

## THE LAND RESIDUAL TECHNIQUE

In the absence of sufficient market data, income-producing land may be valued by determining the portion of the net income attributable to the land and capitalizing the net income into an indication of value. The procedure is:

1. Determine the highest and best use of the land, which may be either its present use or hypothetical use.
2. Estimate the net income which the property can be expected to yield.
3. Estimate the replacement cost new of the improvements.
4. If the case involves the present use, estimate the proper allowance for depreciation, and deduct that amount from the replacement cost new of the improvements to arrive at an estimate of their depreciated value.
5. Develop appropriate capitalization rates.
6. Calculate the income requirements of the improvements, and deduct the amount from the total net income to derive that portion of the income which can be said to be attributable to the land.
7. Capitalize the residual income attributable to the land to an indication of value.

## RATIO METHOD

A technique useful for establishing broad indications of land values is a “typical” allocation or ratio method. In this technique,

the ratio of the land value to the total value of improved properties is observed in situations where there is good market and/or cost evidence to support both the land values and total values. This market-abstracted ratio is then applied to similar properties where the total values are known, but the allocation of values between land and improvements are not known. The ratio is usually expressed as a percentage which represents the portion of the total improved value that is land value, or as a formula:

$$\frac{V_1}{V_2} \times 100\% = V_3$$

where:

- V<sub>1</sub> = Total Land Value
- V<sub>2</sub> = Total Property Value
- V<sub>3</sub> = Percent Land is of Total Property Value

This technique can be used on most types of improved properties, with important exceptions being farms and recreational facilities, provided that the necessary market and/or cost information is available. In actual practice, available market information limits this technique primarily to residential properties, and to a much lesser extent, commercial and industrial properties such as apartments, offices, shopping centers, and warehouses.

The ratio technique cannot give exact indications of land values. It is nevertheless useful, especially when used in conjunction with other techniques of estimating land values because it provides an indication of the reasonableness of the final estimate of land value.

The ratio should be extracted from available market information and applied to closely similar properties. It should be noted that any factor that affects values may also

affect the ratio of values. Zoning is particularly important because it may require more or less improvements be made to the land, or may require a larger or smaller minimum size. This tends to have a bearing on the land values, and so it may also influence the ratio of values considerably from community to community.

The following is an example of a residential land valuation situation.

*Market information derived from an active new subdivision:*

Typical Lot Sale Price (most lots equivalent)  
\$15,000  
Improved Lot Sales (range)  
\$65,000 to \$75,000

\$15,000 / \$65,000 = 23%  
\$15,000 / \$75,000 = 20%

Indicated ratio: 20% to 23%

*Similar subdivision, but 100% developed:*

Improved Lot Sales (range)  
\$85,000 to \$105,000

Broadest Indicated Range of Lot Values  
\$85,000 x 20% = \$17,000  
\$105,000 x 23% = \$24,150  
Value range: \$17,000 to \$24,150

Narrowest Indicated Range of Lot Values  
\$85,000 x 23% = \$19,550  
\$105,000 x 20% = \$21,000  
\$19,550 to \$21,000

If both lots and improvements vary considerably, the broadest range is most appropriate. If most lots vary little and are judged equivalent but the improvements vary somewhat, the narrowest range is appropriate. Most subdivisions exhibit a combination of the two ranges, showing a narrow typi-

cal range, but a wider actual range of land values.

## MASS APPRAISING

In preceding sections, we have outlined the fundamental concepts, principles, and valuation techniques underlying the Appraisal Process. We will now approach the problem at hand...the revaluation of certain specified real property within a total taxing jurisdiction, be it an entire county or any subdivision thereof...and to structure a systematic mass appraisal program to effect the appraisal of said properties in such a way as to yield valid, accurate, and equitable property valuations at a reasonable cost dictated by budgetary limitations, and within a time span totally compatible with assessing administration needs.

The key elements of the program are validity, accuracy, equity, economy, and efficiency. To be effective, the program must:

Incorporate the application of proven and professionally acceptable techniques and procedures

Provide for the compilation of complete and accurate data and the processing of that data into an indication of value approximating the prices actually being paid in the market place

Provide the necessary standardization measures and quality controls essential to promoting and maintaining uniformity throughout the jurisdiction

Provide the appropriate production controls necessary to execute each phase of the operation in accordance with a carefully planned budget and work schedule.

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asures and quality controls essential to promoting and maintaining uniformity throughout the jurisdiction

Provide the appropriate production controls necessary to execute each phase of the operation in accordance with a carefully planned budget and work schedule

Provide techniques especially designed to streamline each phase of the operation, eliminating superfluous functions, and reducing the complexities inherent in the Appraisal Process to more simplified but equally effective procedures.

In summary, the objective of an individual appraisal is to arrive at an opinion of value, the key elements being the validity of the approach and the accuracy of the estimate. The objective of a mass appraisal for tax purposes is essentially the same. However, in addition to being valid and accurate, the value of each property must be equitable with other property, and what's more, these valid, accurate, and equitable valuations must be generated as economically and efficiently as possible.

## OVERVIEW

The prime objective of mass appraisals for tax purposes is to equalize property values. Not only must the value of one residential property be equalized with another, but it must also be equalized with each commercial and industrial property within the political unit.

The common denominator or the basis for equalization is market value that price which an informed and intelligent person, fully aware of the existence of competing properties and not being compelled to act, is justified in paying for a particular property.

The job of the appraiser is to arrive at a reasonable estimate of that justified price. To accomplish this, the coordination of approaches to the valuation of the various classes of property must be made so that they are related one to another in such a way as to reflect the motives of the prospective purchasers of each type of property.

A prospective purchaser of a residential property is primarily interested in its capacity to render service to the family as a place to live. Its location, size, quality, design, age, condition, desirability and usefulness are the primary factors to be considered in making a selection. By relying heavily upon powers of observation and inherent intelligence, knowing what could be afforded and simply comparing what is available, one property will eventually stand out to be more appealing than another. So it is likewise the job of the appraisers to evaluate the relative degree of appeal of one property to another for tax purposes.

The prospective purchaser of agricultural property will be motivated somewhat differently. The primary interest will be in the productive capabilities of the land. It is reasonable to assume that the purchaser will be familiar, at least in a general way, with the productive capacity of the farm. It might be expected that the prudent investor will have compared one farm's capabilities against another. Accordingly, the appraiser for local tax equalization purposes must rely heavily upon production information that results from accepted management practices.

The prospective purchaser of commercial property is primarily interested in the potential net return and tax shelter the property will provide. That price which is justified to pay for the property is a measure of the prospects for a net return from the investment. Real estate, as an investment then, must

not only compete with other real estate, but also with stocks, bonds, annuities, and other similar investment areas. The commercial appraiser must explore the rental market and compare the income producing capabilities of one property to another.

The prospective purchaser of industrial property is primarily interested in the overall utility value of the property. Of course, in evaluating the overall utility, individual consideration must be given to the land and each improvement thereon. Industrial buildings are generally of special purpose design, and as such, cannot readily be divorced from the operation for which they were built. As long as the operation remains effective, the building will hold its values; if the operation becomes obsolete, the building likewise becomes obsolete. The upper limit of its value is its replacement cost new, and its present day value is some measure of its present day usefulness in relation to the purpose for which it was originally designed.

Any effective approach to valuations for tax purposes must be patterned in such a way as to reflect the "modus operandi" of buyers in the market place. As indicated above, the motives influencing prospective buyers tend to differ depending upon the type of property involved. It follows that the appraiser's approach to value must differ accordingly.

The residential appraiser must rely heavily upon the market data approach to value... analyzing the selling prices of comparable properties and considering the very same factors of location, size, quality, design, age, condition, desirability, and usefulness which were considered by the buyer.

The farm appraiser must rely primarily upon an effective analysis of the farm's "prostead" or "farm home site" valuation.

The commercial appraiser will find that since commercial property is not bought and sold as frequently as is residential property, the sales market cannot be easily established. Consequently, relying heavily on the income approach to value will require that the net economic rent, for which the property is capable of yielding, must be determined. The amount of investment required to effect that net return at a rate commensurate with that normally expected by investors must also be determined. This can only be achieved through a comprehensive study of the income producing capabilities of comparable properties and an analysis of present day investment practices.

The industrial appraiser will seldom be able to rely on the market data approach because of the absence of comparable sales. Also, it is not possible to rely upon the income approach...again because of the absence of comparable investments, and because of the inability to accurately determine the contribution of each unit of production to the overall income produced. Therefore, by relying heavily on the cost approach to value, a determination must be made of the upper limit or replacement cost new of each improvement and the subsequent loss of value resulting overall from physical, functional, and economic factors.

The fact that there are different approaches to value, some of which are more applicable to one type of property than to another, does not, by any means, preclude equalization between types. Remember that the objective in each approach is to arrive at a price that an informed and intelligent person, fully aware of the existence of competing properties and not being compelled to act, is justified in paying for any one particular property. Underlying and fundamental to each of the approaches is the comparison process. Regardless of whether the principal

criteria are actual selling prices, income producing capabilities, or functional usefulness, like properties must be treated alike. The primary objective is equalization. The various approaches to value, although valid in themselves, must nevertheless be coordinated one to the other in such a way as to produce values that are not only valid and accurate, but are also equitable. The same "yardstick" of value must be applied to all properties, and must be applied by systematic and uniform procedures.

It is obvious that sales on all properties are not required to effectively apply the market data approach. The same is true regarding any other approach. What is needed is a comprehensive record of all the significant physical and economic characteristics of each property in order to compare the properties of "unknown" values with the properties of "known" values. All significant differences between properties must in some measure, either positively or negatively, be reflected in the final estimate of value.

Each property must be given individual treatment, but the treatment must be uniform and standardized, and essentially no different than that given to any other property. All the factors affecting value must be analyzed and evaluated for each and every property within the entire political unit. It is only by doing this that equalization between properties and between types of properties can be ultimately affected.

All this, at best, is an oversimplification of the equalization process underlying the entire Mass Appraisal Program. The program itself consists of various operational phases, and its success depends primarily upon the systematic coordination of collecting and recording data, analyzing the data, and processing the data to an indication of value.

## DATA INVENTORY

Basic to the appraisal process is the collection and recording of pertinent data. The data will consist of general supporting data, referring to the data required to develop the elements essential to the valuation process; neighborhood data, referring to information regarding pre delineated neighborhood units; and specific property data, referring to the data compiled for each parcel of property to be processed into an indication of value by the cost, market and/or income approach.

The data must be comprehensive enough to allow for the adequate consideration of all factors that significantly affect property values. In keeping with the economics of a mass appraisal program, it is costly and impractical to collect, maintain, and process data of no or marginal contribution to the desired objectives. The axiom "too much data is better than insufficient data" does not apply. What does apply is the proper amount of data, no more or no less, which is necessary to provide the database required to generate the desired output.

**General Supporting Data.** The appraisal staff will be primarily concerned with cost, sales and income data, but they will also find it necessary to research and compile general socioeconomic information pertaining to the entire political unit under appraisal. The information will serve to assist the staff during the analytical phase of the operation and should include, but not necessarily be limited to, population trends, prevailing geographical factors, primary transportation facilities, primary income sources, unemployment and income levels, institutional influences, the annual volume of new construction and ownership transfers, availability of vacant land, construction labor and material costs, preponderance of residential rentals, and the amount of residential vacancies.

To apply the cost approach to value, cost data must be sufficient to develop or select and validate the pricing schedules and cost tables required to compute the replacement cost new of improvements.

All data pertaining to the cost of total buildings in place should include the parcel identification number, property address, date of completion, construction cost, name of builder, source of information, structural characteristics, and other information pertinent to analysis.

Cost information may be recorded on the same form used to record specific property data.

The principal sources for obtaining cost data are builders and developers, and it is generally advisable to collect cost data in conjunction with new construction pick-ups.

Sales data must be sufficient enough to provide a representative sampling of comparable sales needed to apply the market data approach, to derive unit land values and depreciation indicators needed to apply the cost approach, and to derive gross rent multipliers and elements of the capitalization rate needed to apply the income approach.

All sales data should include the parcel identification number, property classification code, month and year of sale, selling price, source of information, i.e., buyer, seller, agent, or fee, and a reliable judgment as to whether or not the sale is representative of a true arm's length transaction.

Sales data should be recorded on the same form (assigned property record card) used to record specific property data, and verified during the property-listing phase.

The principal source for obtaining sales data is the Realty Transfer Certificate. Other sources may include multiple listing services, developers, realtors, lending institutions, and individual owners during the listing phase of the operation.

Income and expense data must be sufficient enough to derive capitalization rates and accurate estimates of net income needed to apply the income approach.

Income and expense data should include both general data regarding existing financial attitudes and practices, and specific data regarding the actual incomes and expenses realized by specific properties.

The general data should include such information as equity return expectations, gross rentals, vacancy and operating cost expectations and trends, prevailing property management costs, and prevailing mortgage costs.

Specific data should include the parcel identification number, property address (or building ID), source of information, the amount of equity, the mortgage and lease terms, and an itemized account of the annual gross income, vacancy loss, and operating expenses for the most recent two year period.

The general data should be documented in conjunction with the development of capitalization procedural guidelines. The specific data, since it is often considered confidential and not subject to public access, should be recorded on special forms, designed in such a way as to accommodate the property owner or agent thereof in submitting the required information. The forms should also have space reserved for the appraiser's analysis and calculations.

The principal sources for obtaining the general financial data are investors, lending institutions, and property managers. The primary sources for obtaining specific data are the individual property owners and/or tenants during the listing phase of the operation.

**Neighborhood Data.** At the earliest feasible time during the data inventory phase of the operation, and after a thorough consideration of the living environment and economic characteristics of the overall county, or any political subdivision thereof, the appraisal staff should delineate the larger jurisdictions into smaller "neighborhood units," each exhibiting a high degree of homogeneity in residential amenities, land use, economic trends, and housing characteristics such as structural quality, age, and condition. The neighborhood delineations should be outlined on an index (or comparable) map and each assigned an arbitrary Neighborhood Identification Code, which when combined with the parcel identification numbering system, will serve to uniquely identify it from other neighborhoods.

Neighborhood data must be comprehensive enough to permit the adequate consideration of value influencing factors to determine the variations in selling prices and income yields attributable to benefits arising from the location of one specific property as compared to another. The data should include the taxing district, the school district, the neighborhood identification code, special reasons for delineation (other than obvious physical and economic boundaries), and the neighborhood characteristics such as the type (urban, suburban, etc.), the predominant class (residential, commercial, etc.), the trend (whether it is declining, improving, or relatively stable), its accessibility to the central business district, shopping centers, interstate highways and primary transportation termi-

nals, its housing characteristics, the estimated range of selling prices for residentially improved properties, and a rating of its relative durability.

All neighborhood data should be recorded on a specially designed form during the delineation phase.

Specific property data must be comprehensive enough to provide the data base needed to process each parcel of property to an indication of value, to generate the tax roll and related tax roll requirements, to generate other specified output, and to provide the assessing officials with a permanent record to facilitate maintenance functions and to administer taxpayer assistance and grievance proceedings.

The data should include the parcel identification number, ownership and mailing address, legal description, property address, property classification code, local zoning code, neighborhood identification code, site characteristics, and structural characteristics.

All the data should be recorded on a single, specially designed data collection card customized to meet individual assessing needs. Each card should be designed and formatted in such a way as to accommodate the listing of information and to facilitate data processing. In addition to the property data items noted above, space must be provided for a building sketch, land and building computations, summarizations, and memoranda. In keeping with the economy and efficiency of a mass appraisal program, the card should be formatted to minimize writing by including a sufficient amount of site and structural descriptive data that can be checked and/or circled.

The descriptive data should be comprehensive enough to be suitable for listing any

type of land and improvement data regardless of class, with the possible exception of large industrial, institutional, and utility complexes that require lengthy descriptions. In these cases, it will generally be necessary to use a specially designed supplemental property record document, keyed and indexed to the corresponding data collection card. The data collection card should be made a permanent part of the assessing system, and used not only in conjunction with the revaluation, but also to update the property records for subsequent assessments.

The specific property data should be compiled from existing office records and field inspections. The parcel identification number, ownership, mailing address, and legal description may be obtained from existing tax rolls. Property classification codes may also be obtained from existing tax rolls (whenever available) and verified in the field. Local zoning codes may be obtained from existing zoning maps. Neighborhood identification codes may be obtained from the neighborhood delineation maps. Lot sizes and acreage may be obtained from existing tax maps. The property address, and the site and structural characteristics may be obtained by making a physical inspection of each property.

Qualified appraisers must conduct Field inspections. In the course of the inspection, the following procedures must be adhered to:

identification of the property.

recording the property address.

interviewing the occupant of the building and recording all pertinent economic data.

inspection of the interior of the building data.

measuring and inspecting the exterior of the

building, as well as all other improvements on the property, and recording the story height, and the dimensions and/or size of each.

recording a sketch of the principal building(s), consisting of a plan view showing the main portion of the structure along with any significant attached exterior features, such as porches, etc. All components must be identified and the exterior dimensions shown for each.

selection of and recording the proper quality grade, physical condition, and effective age of the improvement.

selection of and recording the proper replacement costs or replacement cost adjustments for all field priced items.

reviewing the data collection card for completeness and accuracy.

After the field inspection is completed, the data collection cards must be reviewed for completeness and accuracy.

Complete and accurate data is essential to the program. Definite standardized data collection and recording procedures must be followed if these objectives are to be met.

## **PROCESSING THE DATA**

This phase of the operation involves the analysis of data compiled during the data inventory phase and the processing of that data to an indication of value through the use of the cost, market, and income approaches to value.

During the analytical phase, it will be necessary to analyze cost, market, and income data in order to provide a basis for validating the appropriate cost schedule and

tables required to compute the replacement cost new of all buildings and structures; for establishing comparative unit land values for each type of property; for establishing the appropriate depreciation tables and guidelines for each type of property; and for developing gross rent multipliers, economic rent and operating expense norms, capitalization rate tables and other related standards and norms required to effect the mass appraisal of all the property within an entire political unit on an equitable basis.

After establishing the appropriate standards and norms, the specific data compiled for each property must be analyzed. This is done by giving due consideration to the factors influencing the value of that particular property as compared to another, and then to process the data into an indication of value by employing the techniques described in the section of the manual dealing with the application of the traditional approaches to value.

Any one, or all three of the approaches, if applied properly, should lead to an indication of market value; of primary concern is applying the approaches on an equitable basis. This may require the coordinated effort of a number of individual appraisers, each appraiser acting as a member of a team, with the team effort directed toward a valid, accurate and equitable appraisal of each property within the political unit.

Verification of the accuracy of each of the characteristics recorded on the data collection card.

Determination of the proper quality grade and design factor to be applied to each building to account for variations from the base specifications.

Making a judgment of the overall condition, desirability, and usefulness of each

improvement in order to arrive at a sound allowance for depreciation.

other resources available to obtain the highest degree of accuracy and equity possible.

Capitalization of net income capabilities into an indication of value in order to determine the loss of value attributable to functional and economic obsolescence.

Addition of the depreciated value of all improvements to the land value, and reviewing the total property value in relation to the value of comparable properties.

Determination that the total property value established can be correlated to actual sales of comparable properties.

Once the final values have been established for each property, the entire program should be evaluated in terms of its primary objectives: Do the values approximate a satisfactory level of market value, and more importantly, are the values equitable? Satisfactory answers to these questions can best be obtained through a statistical analysis of recent sales in an appraisal to sale ratio study, if sufficient sales are available.

The techniques and procedures set forth herein, if applied skillfully, should yield highly accurate and equitable property valuations, and should provide a sound property tax base. It should be noted, however, that no program, regardless of how skillfully administered, can ever be expected to be error free. The appraisal must be fine-tuned and this can best be done by giving the taxpayer an opportunity to question the value placed upon his property and to produce evidence that the value is inaccurate or inequitable. During this time, the significant errors will be brought to light, and taking the proper corrective action will serve to further the objectives of the program. What's important in the final analysis is to use all these measures as well as any

## PARCEL SIZING PROCEDURES

The majority of parcels are shaped in a way which readily lends them to the application of standard front foot sizing procedures and techniques. This section contains an explanation of those procedures. Standardized procedures are essential to maintaining uniformity in land valuations. The appraiser must at all times exercise sound judgment in determining whether or not the procedures are applicable, using them only if they calculate accurate, equitable land valuations.

## PARCEL SIZING PRINCIPLES

The most important rule of lot sizing is that the established frontage and depth must form right angles. The Depth lines must be parallel to each other and the Width (Frontage) line perpendicular to the Depth lines. Prior to establishing the size of a lot, the scale of the plat must be established.

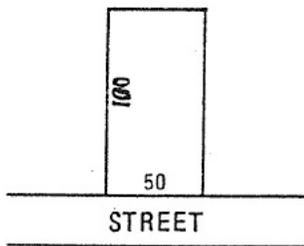


Figure 1

Figure 1 shows a 100% lot: the vertical lines form right angles with the horizontal lines. There are not any lines in this lot that do not form a 90 degree angle.

The Lot size would be shown as:

FRONT FOOT TYPE	WIDTH (FRONTAGE)	DEPTH
1	50	100

Note the placement of the lot to the street. In the majority of situations, the narrowest portion of the lot is the width. Only if this lot were a corner lot would the pos-

sibility exist for the frontage to be 100. The position of the house should be considered in a corner lot situation.

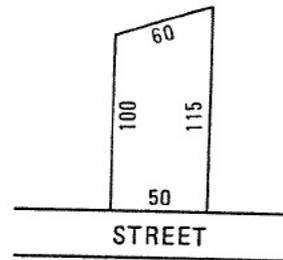


Figure 2

The Lot in Figure 2 is similar to the previous example. Note that the 60' back lot line is not perpendicular to the depth lines. However, the 50' front lot line is. The Depth lines form right angles with the frontage, but vary in length. To establish the depth, these must be averaged.  $100 + 115 = 215$ .  $215$  divided by  $2$  equals  $107.5$ . ( $0.5$  or more is rounded up).

The Lot size would be shown as:

FRONT FOOT TYPE	WIDTH (FRONTAGE)	DEPTH
1	50	108

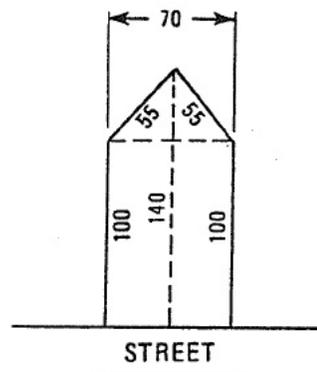


Figure 3

The Lot in Figure 3 is another example of average depth lot. The frontage is the line which is perpendicular to the depth lines. In this example, the frontage is 70'. In many situations, additional lines will need to be drawn to establish an accurate depth. By using only the 100' line as the depth, you would be totally disregarding the rear portion of the lot. Therefore, an additional depth line must be drawn (the dotted line perpendicular to the frontage). Any lines drawn to establish depth must be perpendicular to the frontage line. Also, this line or lines must be of equal increments within the parallel depth lines. The lines drawn to establish depth will have to be measured to scale for computation. The total of all depth lines is averaged for the effective depth:

$$100' + 140' + 100' = 340$$

$$\text{divided by } 3 = 113.33$$

The Lot size would be shown as:

FRONT FOOT TYPE	WIDTH (FRONTAGE)	DEPTH
3	70	113

The example in Figure 4 is very similar to the previous one. Again, additional depth lines must be drawn perpendicular to the frontage in equal increments and measured to scale. Once measured, they can be added and averaged as shown here:

$$70' + 75' + 90' + 100' + 90' = 425$$

$$425 \text{ divided by } 5 = 85' \text{ average depth}$$

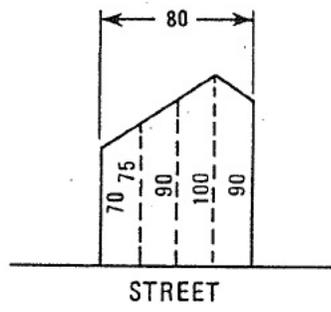


Figure 4

The entries for Figure 4 would be:

FRONT FOOT TYPE	WIDTH (FRONTAGE)	DEPTH
3	80	85

All previous examples have had at least three of the frontage and depth lines perpendicular and parallel. In the Figure 5 example, a right triangle, there are only two perpendicular lines. When any Lot or portion of a Lot forms a right triangle, enter the Lot type that represents the triangular lot, the width and the depth. (The width is the line that runs parallel to the street, whether or not it actually borders the street.)

If the base of the triangle is on the street (Figure 5), use Front Foot type (7) triangle back apex. If the apex of the triangle is on the street (Figure 6), use Front Foot type (6) triangle front apex.

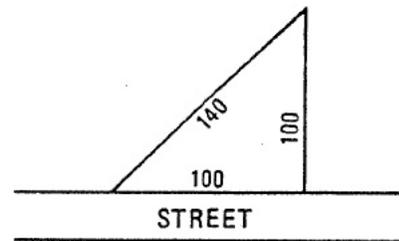


Figure 5

The depth is the line that is perpendicular to the width and in this example equals 100. The Lot size in Figure 5 would be shown as follows:

FRONT FOOT TYPE	WIDTH (FRONTAGE)	DEPTH
7	100	100

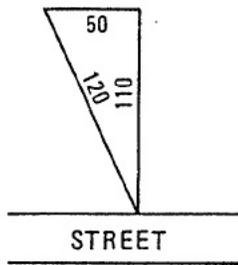


Figure 6

The Lot size in Figure 6 would be:

FRONT FOOT TYPE	(FRONTAGE)	WIDTH DEPTH
6	50	110

In example Figure 7, the width lines are parallel, but the lines used to determine the depth are neither parallel to one another, nor perpendicular to the frontage line. Depth lines must be drawn and measured to scale. After the depth lines (dotted lines) are drawn, you will notice that within this Lot there are three individual lots. There are two back apex triangles and one regular Lot. The frontage is calculated as follows:

140 Gross Width – the widest portion of the lot which will form right angles with the drawn depth lines.

- 60 Regular Lot Width

The width of both back apex triangular lots would be 40' each (80 divided by 2).

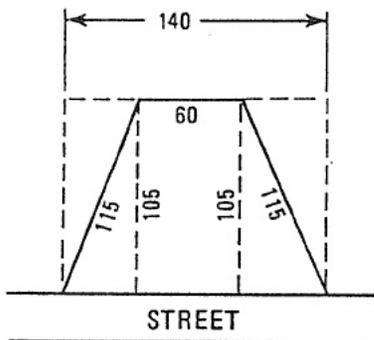


Figure 7

This lot would require 3 Front Foot entries:

FRONT FOOT TYPE	(FRONTAGE)	WIDTH DEPTH
1	60	105
7	40	105
7	40	105

The Figure 8 example is just the reverse of the previous example. It is calculated in the same method, but Front Foot type (6), triangle front apex, is used because the apex of the triangles are on the street. Note: Depth is measured to scale along perpendicular lines.

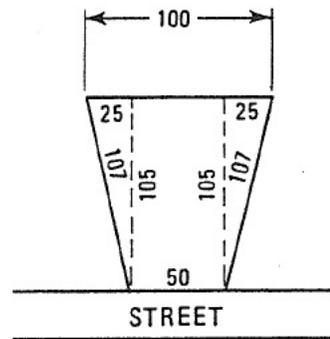


Figure 8

The Front Foot entries for Figure 8 would be:

FRONT FOOT TYPE	(FRONTAGE)	WIDTH DEPTH
1	50	105
6	25	105
6	25	105

The lot shown in Figure 9 is referred to as a double entry lot. The lines are all perpendicular and parallel. However, two dis-

tinct lots can be formed for this one lot (note dotted line). This lot will have two frontages and two depths.

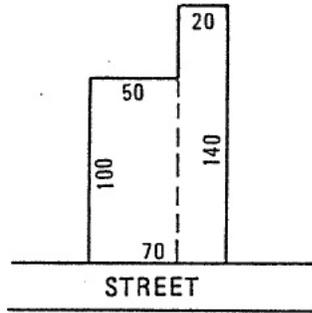


Figure 9

The Land size for Figure 9 would be:

FRONT FOOT TYPE	(FRONTAGE)	WIDTH DEPTH
1	50	100
1	20	140

Lot No. 2 in Figure 10 is also a double entry lot. However, it differs from the previous example because the 50 x 50 portion of the lot at the rear has no street frontage. This is called a back lot and must be coded as such. This back lot has considerably less utility value and compensation must be made. An adjustment must be applied to show a lesser value than a lot having direct street access.

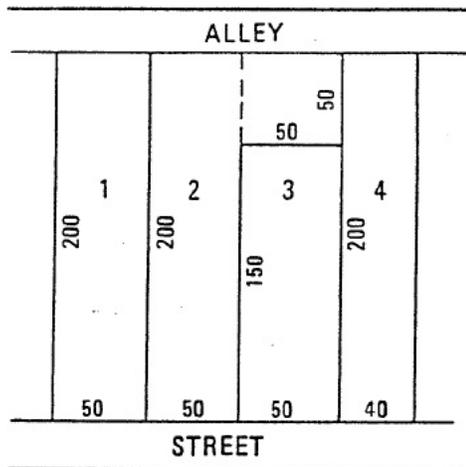


Figure 10

NOTE: Back lots require careful consideration in order to predict the interaction of standard frontage and excess frontage calculations on the total lot value.

The Lot size would be shown as follows:

FRONT FOOT TYPE	(FRONTAGE)	WIDTH DEPTH
1*	100	200
2*	50	150

\* A back lot entry must be used with a regular lot entry. The back lot entry subtracts the value of that portion of the regular lot entry that is not actually part of that lot. Back lot entries are always minus values.

Lots that are very irregular in shape, like the examples of Figures 11 and 12, would be better valued using the square foot lot entries.

The lot in Figure 11 does not have any two lines perpendicular or parallel.

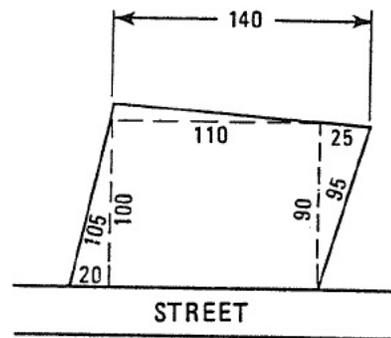


Figure 11

The type of lot shown in Figure 12 is usually found on a cul-de-sac.

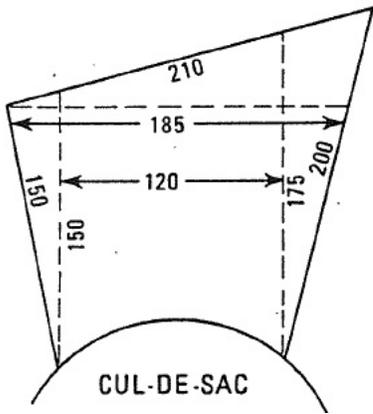
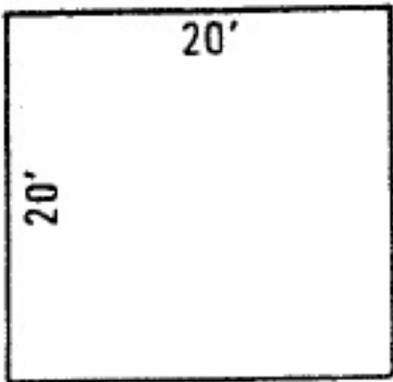


Figure 12

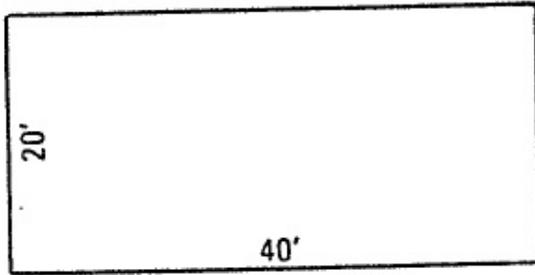
## PARCEL SQUARE FOOTAGE FORMULAS

### 1. Square



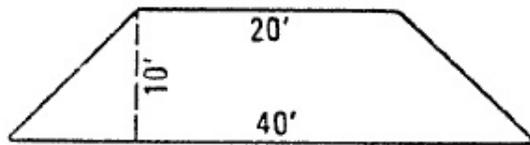
Area = Base x Height  
 Example: Area = 20' x 20'  
 Area = 400 sq. ft.

### 2. Rectangle



Area = Base x Height  
 Example: Area = 40' x 20' = 800 sq. ft.

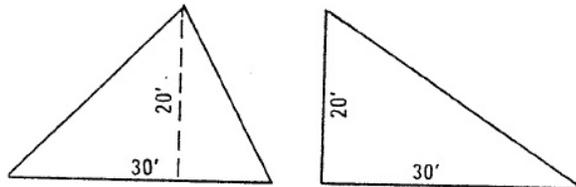
### 3 Trapezoid



Area = Height x  $\frac{\text{Sum of 2 Bases}}{2}$

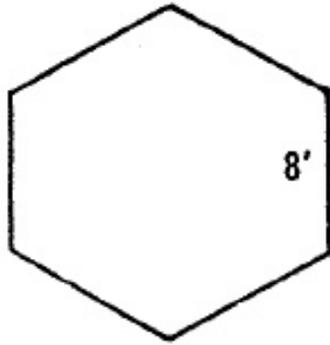
Example:  $10 \times \frac{60}{2}$

### 4. Triangle



Area =  $\frac{1}{2}$  Height x Base  
 Example: = 10 x 30

## 5. Regular Polygon



Area:

5 sides = 1.7205 x Side Squared

6 sides = 2.5981 x Side Squared

7 sides = 3.6339 x Side Squared

8 sides = 4.8284 x Side Squared

9 sides = 6.1818 x Side Squared

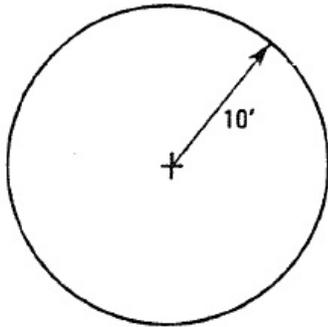
10 sides = 7.6942 x Side Squared

11 sides = 9.3656 x Side Squared

12 sides = 11.1962 x Side Squared

Example:  $2.5981 \times (8^2) = 166$  sq. ft.

## 6. Circle



Area = Pi x (Radius Squared)

Example:  $3.1416 \times (10' \times 10') = 314$  sq. ft.

## LOT DEPTH VALUATION FACTORS

### PARCEL DEPTH VALUATION CALCULATIONS

These tables are to be used as guides for calculating values for lots that are either shorter or longer than the standard lot depth in the area.

Standard lot depths are shown across the top of the tables above the solid line. The left-hand column shows various actual depths that may exist.

Select the actual depth of the lot and follow across to the proper standard lot depth for the area being appraised. The figure encountered is the percentage factor to be applied to the front foot value of the lot. The modified front foot value is then multiplied by the width of the lot.

This is essentially one large table giving depth factors for lots from 10 to 200 feet deep and standard depths ranging from 100 to 160 feet. The numbers are to be regarded as percentages.

The front foot depth factor is equal to the square root of the ratio of the actual depth to the standard depth.

$$\text{Depth factor} = \sqrt{\frac{\text{Actual Depth}}{\text{Standard Depth}}}$$

For example: a 90 foot deep lot where the standard depth is 100 feet gives a depth factor:

$$\sqrt{90/100} = \sqrt{0.90} = 95\%$$

## LOT DEPTH VALUATION FACTORS TABLE

ACTUAL DEPTH	STANDARD DEPTH											
	100	110	115	120	125	130	135	140	145	150	155	160
10	32	30	29	29	28	28	27	27	26	26	25	25
12	35	33	32	32	31	30	30	29	29	28	28	27
14	37	36	35	34	33	33	32	32	31	31	30	30
16	40	38	37	37	36	35	34	34	33	33	32	32
18	42	40	40	39	38	37	37	36	35	35	34	34
20	45	43	42	41	40	39	38	38	37	37	36	35
22	47	45	44	43	42	41	40	40	39	38	38	37
24	49	47	46	45	44	43	42	41	41	40	39	39
26	51	49	48	47	46	45	44	43	42	42	41	40
28	53	50	49	48	47	46	46	45	44	43	43	42
30	55	52	51	50	49	48	47	46	45	45	44	43
32	57	54	53	52	51	50	49	48	47	46	45	45
34	58	56	54	53	52	51	50	49	48	48	47	46
36	60	57	56	55	54	53	52	51	50	49	48	47
38	62	59	57	56	55	54	53	52	51	50	50	49
40	63	60	59	58	57	55	54	53	53	52	51	50
42	65	62	60	59	58	57	56	55	54	53	52	51
44	66	63	62	61	59	58	57	56	55	54	53	52
46	68	65	63	62	61	59	58	57	56	55	54	54
48	69	66	65	63	62	61	60	59	58	57	56	55
50	71	67	66	65	63	62	61	60	59	58	57	56
52	72	69	67	66	64	63	62	61	60	59	58	57
54	73	70	69	67	66	64	63	62	61	60	59	58
56	75	71	70	68	67	66	64	63	62	61	60	59
58	76	73	71	70	68	67	66	64	63	62	61	60
60	77	74	72	71	69	68	67	65	64	63	62	61
62	79	75	73	72	70	69	68	67	65	64	63	62
64	80	76	75	73	72	70	69	68	66	65	64	63
66	81	77	76	74	73	71	70	69	67	66	65	64
68	82	79	77	75	74	72	71	70	68	67	66	65
70	84	80	78	76	75	73	72	71	69	68	67	66
72	85	81	79	77	76	74	73	72	70	69	68	67
74	86	82	80	79	77	75	74	73	71	70	69	68
76	87	83	81	80	78	76	75	74	72	71	70	69
78	88	84	82	81	79	77	76	75	73	72	71	70
80	89	85	83	82	80	78	77	76	74	73	72	71
82	91	86	84	83	81	79	78	77	75	74	73	72
84	92	87	85	84	82	80	79	77	76	75	74	72
86	93	88	86	85	83	81	80	78	77	76	74	73
88	94	89	87	86	84	82	81	79	78	77	75	74
90	95	90	88	87	85	83	82	80	79	77	76	75
92	96	91	89	88	86	84	83	81	80	78	77	76
94	97	92	90	89	87	85	83	82	81	79	78	77
96	98	93	91	89	88	86	84	83	81	80	79	77
98	99	94	92	90	89	87	85	84	82	81	80	78
100	100	95	93	91	89	88	86	85	83	82	80	79
102	101	96	94	92	90	89	87	85	84	82	81	80
104	102	97	95	93	91	89	88	86	85	83	82	81
106	103	98	96	94	92	90	89	87	86	84	83	81
108	104	99	97	95	93	91	89	88	86	85	83	82
110	105	100	98	96	94	92	90	89	87	86	84	83
112	106	101	99	97	95	93	91	89	88	86	85	84
114	107	102	100	97	95	94	92	90	89	87	86	84
116	108	103	100	98	96	94	93	91	89	88	87	85
118	109	104	101	99	97	95	93	92	90	89	87	86
120	110	104	102	100	98	96	94	93	91	89	88	87
122	110	105	103	101	99	97	95	93	92	90	89	87
124	111	106	104	102	100	98	96	94	92	91	89	88
126	112	107	105	102	100	98	97	95	93	92	90	89
128	113	108	106	103	101	99	97	96	94	92	91	89
130	114	109	106	104	102	100	98	96	95	93	92	90
132	115	110	107	105	103	101	99	97	95	94	92	91
134	116	110	108	106	104	102	100	98	96	95	93	92

## LOT DEPTH VALUATION FACTORS

ACTUAL DEPTH	STANDARD DEPTH											
	100	110	115	120	125	130	135	140	145	150	155	160
136	117	111	109	106	104	102	100	99	97	95	94	92
138	117	112	110	107	105	103	101	99	98	96	94	93
140	118	113	110	108	106	104	102	100	98	97	95	94
142	119	114	111	109	107	105	103	101	99	97	96	94
144	120	114	112	110	107	105	103	101	100	98	96	95
146	121	115	113	110	108	106	104	102	100	99	97	96
148	122	116	113	111	109	107	105	103	101	99	98	96
150	122	117	114	112	110	107	105	104	102	100	98	97
152	123	118	115	113	110	108	106	104	102	101	99	97
154	124	118	116	113	111	109	107	105	103	101	100	98
156	125	119	116	114	112	110	107	106	104	102	100	99
158	126	120	117	115	112	110	108	106	104	103	101	99
160	126	121	118	115	113	111	109	107	105	103	102	100
162	127	121	119	116	114	112	110	108	106	104	102	101
164	128	122	119	117	115	112	110	108	106	105	103	101
166	129	123	120	118	115	113	111	109	107	105	103	102
168	130	124	121	118	116	114	112	110	108	106	104	102
170	130	124	122	119	117	114	112	110	108	106	105	103
172	131	125	122	120	117	115	113	111	109	107	105	104
174	132	126	123	120	118	116	114	111	110	108	106	104
176	133	126	124	121	119	116	114	112	110	108	107	105
178	133	127	124	122	119	117	115	113	111	109	107	105
180	134	128	125	122	120	118	115	113	111	110	108	106
182	135	129	126	123	121	118	116	114	112	110	108	107
184	136	129	126	124	121	119	117	115	113	111	109	107
186	136	130	127	124	122	120	117	115	113	111	110	108
188	137	131	128	125	123	120	118	116	114	112	110	108
190	138	131	129	126	123	121	119	116	114	113	111	109
192	139	132	129	126	124	122	119	117	115	113	111	110
194	139	133	130	127	125	122	120	118	116	114	112	110
196	140	133	131	128	125	123	120	118	116	114	112	111
198	141	134	131	128	126	123	121	119	117	115	113	111
200	141	135	132	129	126	124	122	120	117	115	114	112

## DIVISION OF A SECTION OF LAND

1 SECTION = 1 SQ. MILE = 640 ACRES

1 MILE = 8 FURLONGS

320 RODS. = 5280 FT.

1 LINK = 7.92 inches

1 FOOT = 12 inches

1 YARD = 36 inches = 3 feet

1 ROD or POLE = 16.5 feet = 5.5 yards = 25 links

1 CHAIN = 66 feet = 100 links = 4 rods

1 FURLONG = 40 rods = 660 feet

1 MILE = 5280 feet = 320 rods = 80 chains = 8 furlongs

1 SQUARE FOOT = 144 sq. inches

1 SQUARE YARD = 9 sq. feet

1 SQUARE ROD = 272.25 sq. feet = 30.25 sq. yards

1 ACRE = 43560 sq. feet = 160 sq. rods = 10 sq. chains

1 ACRE is about 208.75 feet square or 8 rods wide by 20 rods long or any two numbers of rods whose product is 160 (25 x 125 ft.) = .0717 of an acre.

1 SQUARE MILE or 1 SECTION = 640 acres

1 TOWNSHIP = 36 sq. miles or 36 sections

1 TOWNSHIP = 36 SQUARE MILES

## COUNTY NUMBERS

<u>Name</u>	<u>County No.</u>	<u>Name</u>	<u>County No.</u>
Beaverhead	18	McCone	41
Big Horn	22	Meagher	47
Blaine	24	Mineral	54
Broadwater	43	Missoula	04
Carbon	10	Musselshell	23
Carter	42	Park	49
Cascade	02	Petroleum	55
Chouteau	19	Phillips	11
Custer	14	Pondera	26
Daniels	37	Powder River	09
Dawson	16	Powell	28
Deer Lodge	30	Prairie	45
Fallon	39	Ravalli	13
Fergus	08	Richland	27
Flathead	07	Roosevelt	17
Gallatin	06	Rosebud	29
Garfield	50	Sanders	35
Glacier	38	Sheridan	34
Golden Valley	53	Silver Bow	01
Granite	46	Stillwater	32
Hill	12	Sweet Grass	40
Jefferson	51	Teton	31
Judith Basin	36	Toole	21
Lake	15	Treasure	33
Lewis & Clark	05	Valley	20
Liberty	48	Wheatland	44
Lincoln	56	Wibaux	52
Madison	25	Yellowstone	03
		Yellowstone National Park	57

# GEOCODING

## CONTENT OF DATA FIELDS

The following is an example of a geocode and a list showing the fields in numerical order and describing the data requirements for them. It also shows the number of the screen that contains the field.

An example of a geocode is:

COUNTY	07
TOWNSHIP	3966
SECTION	07
QUARTER SECTION	3
QUARTER SECTION BLOCK	28
QUARTER SECTION LOT	01-99
UNIT NUMBER	0000 to 9999

## GEOCODE OR PARCEL IDENTIFICATION

### COUNTY

For the purpose of the Mass Appraisal System, each county is identified by the number currently being used on the automobile license plates. Counties have been assigned numbers from 01 to 56. (County Numbers table) That portion of Yellowstone National Park that is located in Montana, but is not within any county, has been arbitrarily assigned the number 57.

For example, the county license plate number of Lewis and Clark County is 5. Each single digit number is always prefixed with a leading zero.

### TOWNSHIP

Townships are a part of the federal rectangular survey system, which is a land iden-

tification system. Under this system, land is divided into townships 36 miles square, which are related to base lines established by the federal government. The base line running north and south is known as the "Principal Meridian" while the east and west base line is simply called the "Base Line." The township numbers east or west of the "Principal Meridian" are designated as ranges whereas the numbers north and south of the "Base Line" are tiers. (See Fig. 1.)

For example, the shaded township in Fig. 1 would be described as "Township 3 North, Range 2 East," meaning that the township is situated three tiers north of the Base Line and two tiers east of the Principal Meridian.

Just as unique numbers have been assigned to counties, it has also been necessary to assign a unique number to each township or portion of a township that lies within any county in the state. This has been done for two purposes. One is to shorten the number of characters required to identify the township and the second is to provide a basis for

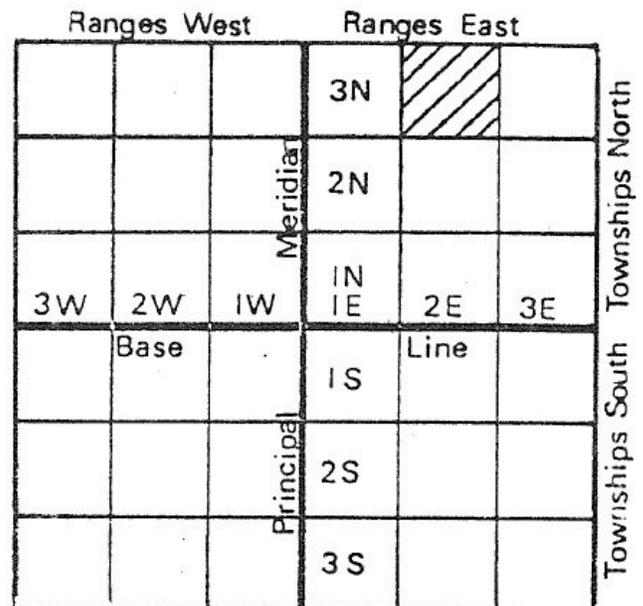


Fig. 1. Townships in relation to the principal meridian and base line.

a computer audit of the legal description carried on each property.

A list of each township designation in Montana, together with the assigned township number and the assigned number for the county in which the township is located, will be found in the Master List of Assigned Township Numbers.

### NUMBERING TOWNSHIPS

Townships have been arbitrarily numbered starting with the most westerly township or part of a township in the most southerly tier of townships. This most southwestern township in the state was numbered "0001." The next easterly township (or part of one) on the same tier of townships was numbered "0002." The next easterly township was numbered "0003." This process was continued until each township or portion of a township in the most southerly tier was consecutively numbered from west to east.

This process was continued on the next most southerly tier of townships and each

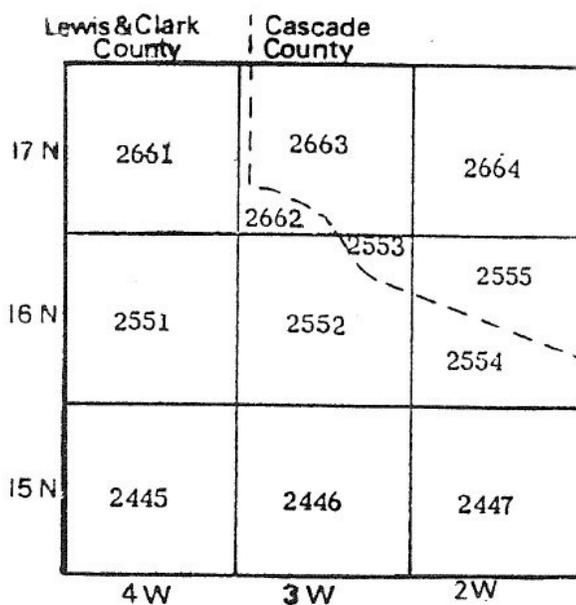


Fig. 2. County lines cutting across townships.

next most southerly tier of townships until all the townships or parts of townships in each county in the state were numbered.

When a county line bisects a township, as shown in Fig. 2, each portion of the township is assigned a separate number.

### SECTION

A township is six miles square or 36 square miles. Each square mile is designated as a section that is equivalent to 640 acres. Sections within a township are numbered from the northeast corner, following a back and forth course, until the last section in the southeast corner is reached. For purposes of land description, sections are commonly divided into half sections containing 320 acres, quarter sections containing 160 acres, etc. Land acreage descriptions are then made by referring to a particular quarter of a particular section located within a particular township, county and state. (See Fig. 3.)

Figs. 3 and 4 demonstrate the subdivision of townships into smaller units. The legal description of the shaded portion of Fig. 3 is: Section 23 Township 4N, Range 4E of the Montana Principle Meridian, County of Gallatin, State of Montana.

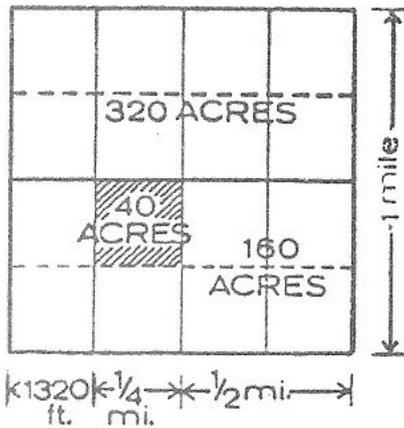
The legal description of the shaded portion of Fig. 4 would be NE4 of the SW4 (which is read "the Northeast quarter of the Southwest quarter") of Section 23, Township 4N, Range 4E of the Montana Principle Meridian, County of Gallatin, State of Montana.

Because of the curvature of the earth, the north/south lines of ranges converge as they extend toward the North Pole. To keep the range lines as nearly six miles apart as possible, the lines are laid out for approximately 24 miles, and then jog so that they are again six miles apart to preserve, as nearly as may

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

6 miles

**Fig. 3.** Subdivision of Township 4 North, Range 4 East into Sections of one mile on each side.

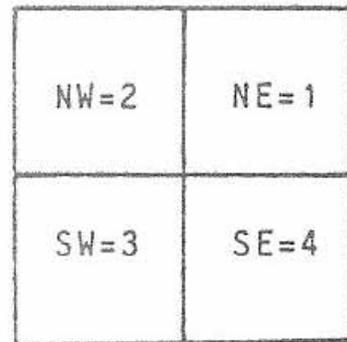


**Fig. 4.** Subdivision of Section 23 showing 320 acre half section, 160 acre quarter section, and (shaded) a quarter section block of 40 acres.

## QUARTER SECTION

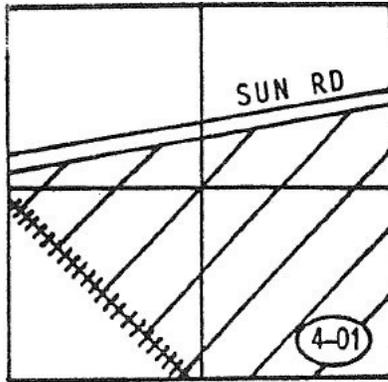
The Quarter Section number assigned to a parcel is the Quarter Section in which the Quarter Section Block is located. Quarter Sections are numbered counterclockwise as follows: NE = 1, NW = 2, SW = 3, SE = 4. (See Fig. 5.)

The Quarter Section, Block, and Lot sequence is a filing number designed to facilitate administrative record keeping and aid in field appraisal work, particularly in densely populated areas with a large number of parcels per section. These numbers are arbitrarily assigned and may or may not have any relationship to block or lot numbers used in a legal location within a section.

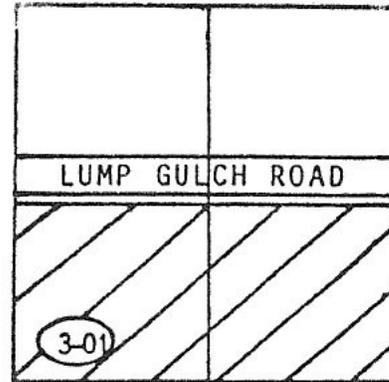


**Fig. 5.** Numbering pattern for quarter sections.

be possible, the square shape of the townships. The irregular shaped areas created in the correction are usually along the north and west sides of a township and are referred to as lots (Government Lots) and are approximately forty acres in size.



**Fig. 6.** A quarter section lying in several quarter sections.



**Fig. 7.** A quarter section lying equally in two quarter sections.

### ASSIGNMENT OF QUARTER SECTION

The following rules are to be used to determine what Quarter Section a Quarter Section Block is numbered in after the block boundaries are delineated.

**Rule 1**, a Quarter Section Block that is partly in two or more Quarter Sections will be numbered in the Quarter Section where the majority of the block lies, as shown in Fig. 6.

**Rule 2**, a Quarter Section Block that is equally in two or more Quarter Sections will be numbered in the lowest numbered Quarter Section, as shown in Fig. 7.

**Rule 3**, a Quarter Section Block that occupies an entire section will be numbered in Quarter Section 1, as shown in Fig. 8.

### QUARTER SECTION BLOCK

A Quarter Section Block is an area, which may be contained by physical features or by boundaries, which may be retained for taxing purposes.

The quarter section block numbering is broken into two methods of usage. There is a system utilized for rural, mostly agricultural,

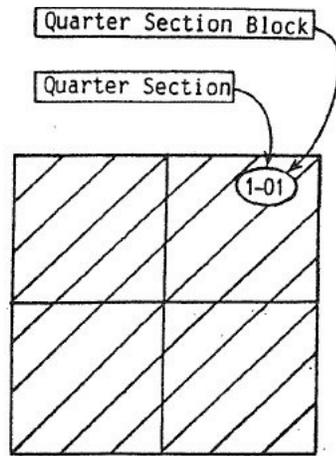
properties and another primarily used for urban and mixed urban/ agricultural property areas.

### QUARTER SECTION BLOCK BOUNDARIES FOR RURAL-AGRICULTURAL AREAS

Rural Quarter Section block boundaries utilize the quarter, quarter lines within the section. These lines should be used as a reference in respect to choosing the appropriate rural quarter section block number to be used. Boundaries in rural areas for quarter section blocks do not need to break along the features listed for urban and mixed properties.

### RURAL AGRICULTURAL QUARTER SECTION BLOCK NUMBERING

The rural system uses the same quarter section numbering scheme to identify a quarter of a section, as seen in Fig. 5. Each quarter section is divided into four parts and uses a numbering sequence as seen in Fig. 9. The quarter number assigned will identify where the majority of the land exists. In cases where there is an equal amount of acres in two or more quarter sections, the lowest quarter section block number that the land falls in should be used.



**Fig. 8.** A quarter section lot occupying an entire quarter section.

Where there is a filed certificate of survey within a section, it is permissible to “bend” the section or even a township line to include the whole survey as a single geocode.

*Extreme caution is advised not to use the rural quarter section block numbering system together with the urban and mixed agricultural/urban numbering system in the same quarter section area. Should this occur, the result could be geocoded blocks with the same number that may be located in different parts of the quarter section.*

### URBAN & MIXED AGRICULTURAL/ URBAN QUARTER SECTION BLOCK BOUNDARIES

The following features may be used as block boundaries for urban and mixed property type areas:

Section lines

Streets

Railroad tracks

State & County boundaries must be used for boundaries

**NOTE:** This does not include railroad spur lines that do not divide private ownership. In railroad yards, only the outermost

NWNW 2-02	NENW 2-01	NWNE 1-02	NENE 1-01
SWNW 2-03	SEnw 2-04	SWNE 1-03	SENE 1-04
NWSW 3-02	NESW 3-01	NWSE 4-02	NESE 4-01
SWSW 3-03	SESW 3-04	SWSE 4-03	SESE 4-04

**Fig. 9.** Rural-Agricultural quarter section – Block numbering by quarter section.

right-of-way should be used as block boundaries.

As with filed certificate of surveys in rural areas, any section line or township line may be crossed with the block boundary to keep the parcel as a single entity.

The following features may be used to subdivide large, irregularly shaped or complex blocks in urban and mixed property type areas.

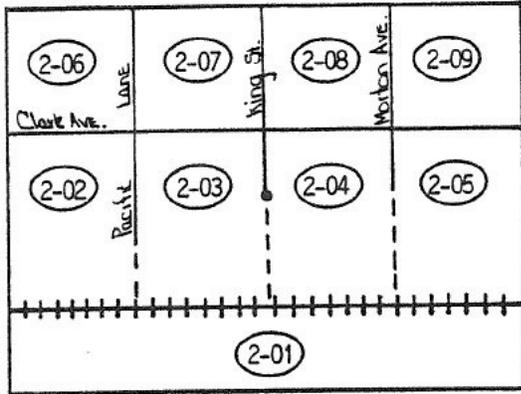
Streams, rivers (as denoted on the USGS Quadrangle Map Series), and other bodies of water (including double-lined drainage).

In some situations, “imaginary” extensions of streets may be used. However, “imaginary” extensions may not be used when any one of the features listed above is available. (See Fig. 10.)

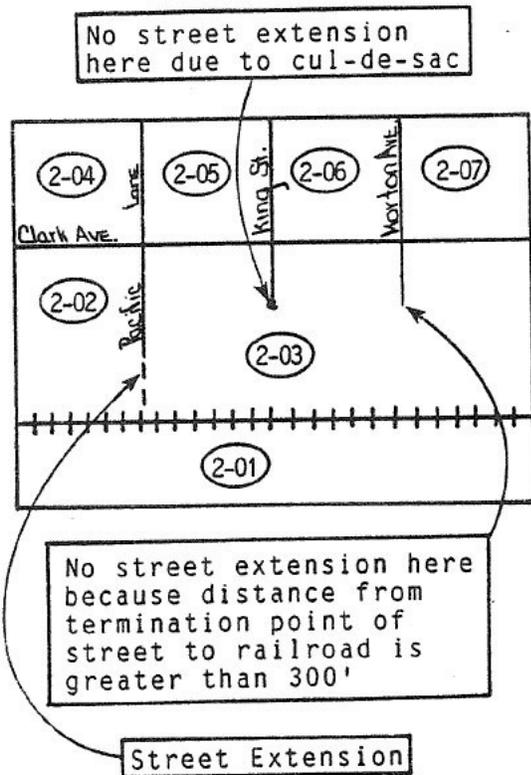
If an “imaginary” extension of a street is to be used, it is subject to the **following conditions:**

The extension cannot exceed 300 feet in length.

Incorrect



Correct



**Fig. 10.** Incorrect and correct usage of the “imaginary” street extension.

The exact location of the beginning point of the extension must be readily identifiable. For example, the extension must never have its beginning point somewhere along a curve of a street. The location of the extension must be clearly understood on the map.

Street extension can never be established where they would split a parcel. (Quarter Section Lot) For example, cul-de-sacs must never be extended, because parcels are frequently located at the end. (see Fig. 10)

Street extensions must be “straight-line” extensions and must intersect the first visible map feature along the extension.

In areas where extensive use of cul-de-sacs make street extensions impossible, the parcels on the cul-de-sac (or multiple cul-de-sacs) may be delineated as a Quarter Section Block. (See Fig. 10.)

The following do not in themselves create Quarter Section Block boundaries.

- Quarter section lines
- Incorporated city or town limits
- School district boundaries
- Addition or subdivision boundaries

**URBAN/MIXED AGRICULTURAL QUARTER SECTION BLOCKS**

Urban/Mixed Agricultural Quarter Section Blocks are consecutively numbered from left to right and from south to north within a Quarter Section. (See Fig. 11.) See QUARTER SECTION to determine in which Quarter Section a Quarter Section Block should be numbered.

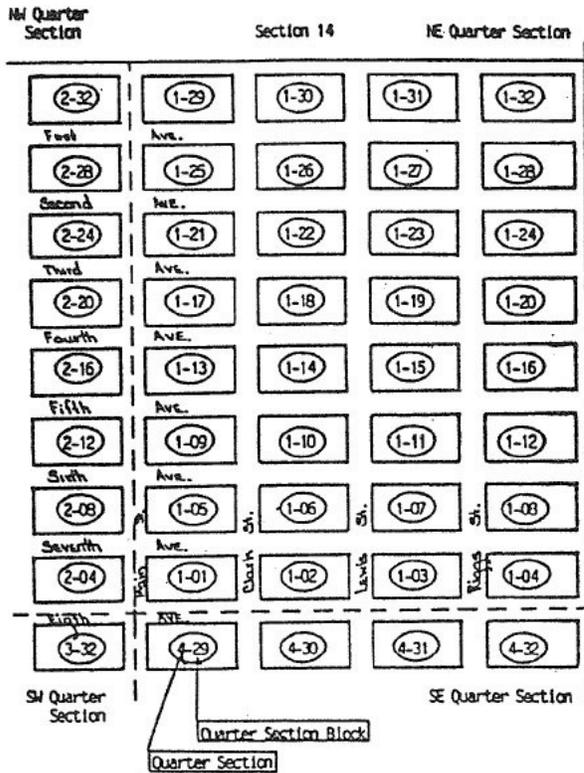


Fig. 11. Quarter section block numbering pattern.

**NOTE:** The use of a section map or city/town map as a control map for Quarter Section Block numbering in urban areas is recommended. The block number can then be transcribed from the control map to the map on which the parcels will be delineated.

There are areas where the consecutive numbering of Quarter Section Blocks is not advisable. This is particularly true in developing areas or areas of rapid growth. It is permissible to leave spaces in the numbering sequence. It is advised to leave spaces in the numbering sequence to accommodate future splits.

If there are any Quarter Section Blocks within a Quarter Section, there should be a block number "01." A Quarter Section Block that occupies the entire section will be numbered block 01 of Quarter Section 1. In some cases, it may be desirable to leave space for

some quarter section block numbers to be used for future splits in developing areas.

Quarter Section Block numbering **CANNOT** exceed 99 for one Quarter Section. If the block numbering does exceed 99, consult your Area Manager to help make the necessary corrections.

When an addition block is in more than one section, a separate Quarter Section Block Number may be assigned to each "piece" of the addition block in each section. (See Fig. 12) However, it is acceptable practice to "bend" the section line around the entire block or down an alley, depending on what makes sense for that particular case.

**REMEMBER:** This system is to aid field review.

If one person owns both blocks or contiguous land in both blocks, use the **SHORT LEGAL DESCRIPTION** field to further explain that the vacated streets are also included as well as describing a full legal description of block and lots involved in the parcel.

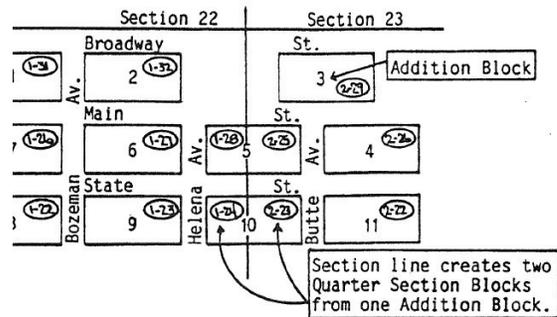


Fig. 12. Quarter section blocks created from addition blocks by section line.

## QUARTER SECTION LOT

A Quarter Section Lot (also known as a parcel) is a contiguous area of land described – separately owned, either publicly or pri-

vately. The only exceptions to this definition are “lots” formed by the bisection of a single ownership by a section line or a taxing jurisdiction such as an incorporated city, town or a school district.

### QUARTER SECTION LOT BOUNDARIES

A Quarter Section Lot may also be divided by the following features:

Quarter Section Block boundaries

Dedicated alleys

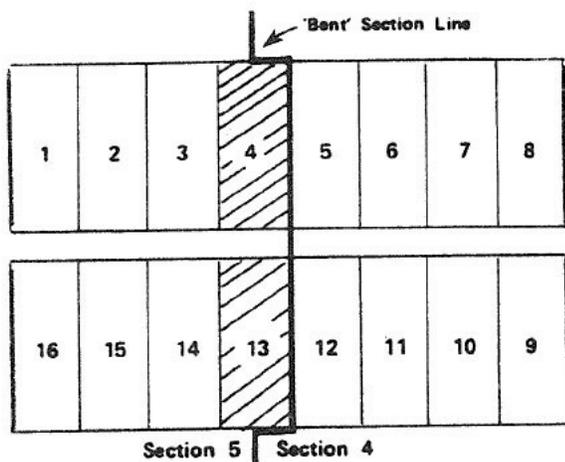
Taxing jurisdictions

Incorporated city or town limits

School district boundaries

A section line (a Quarter Section Block boundary) **DOES NOT** break a platted lot or tract in a dedicated addition or subdivision.

The section line must be “bent” around the lot (or tract) so that the lot (or tract) is coded in the section where the majority of the lot (or tract) lies. (See Fig. 13.)



**Fig. 13.** A section line “bent” around tracts.

The “bending” of the section line should be done to minimize confusion in the field. It is an acceptable practice to “bend” the line around an entire platted block or down an alley, depending on what makes sense for that particular case.

**REMEMBER:** This system is to aid field review.

### NUMBERING OF QUARTER SECTION LOTS

The numbering of Quarter Section Lots should only be done **AFTER** all land within the Quarter Section Block has been accounted for and each ownership delineated.

The Quarter Section Lot numbers are assigned independent of the addition lot numbers. Quarter Section Lots reflect ownerships within a block. The typical numbering sequence is counterclockwise around the block. It is important to skip sequence numbering for multi-lot or description ownerships to accommodate future split occurrences. (See Fig. 14.)

The Quarter Section Lot sequence is to **AID** the appraiser in field appraisal work. The lot numbering sequence should be thought of as the order in which one would drive from parcel to parcel. While this might not be possible in all cases, it can be used as a rule of thumb. A few examples might help to illustrate this point.

Parcels on a cul-de-sac – All parcels fronting on a cul-de-sac should be numbered in sequence, because typically the front of the house faces the cul-de-sac. If a parcel is bounded by both a cul-de-sac and a road, still number the parcel in sequence with the other parcels on the cul-de-sac. (See Fig. 15.)

Skipping occasional numbers through the sequence may aid in future split development.

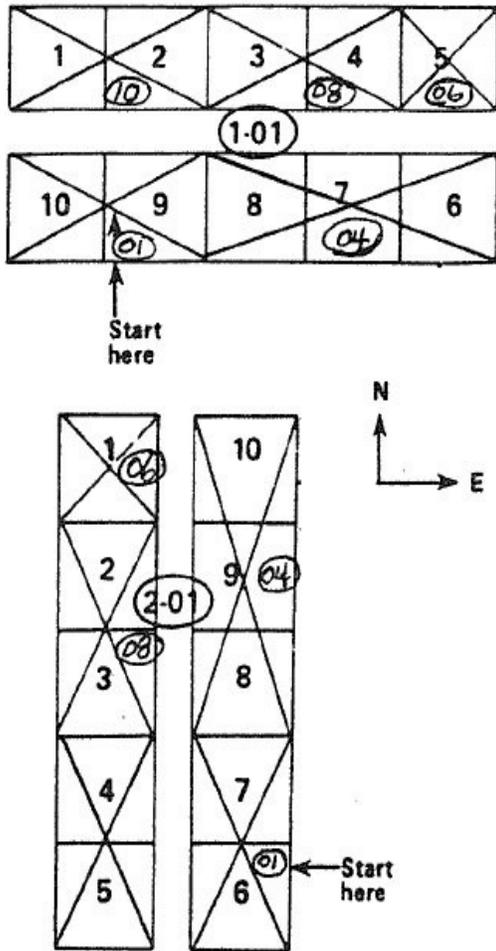


Fig. 14. Assignment of quarter section lot numbers.

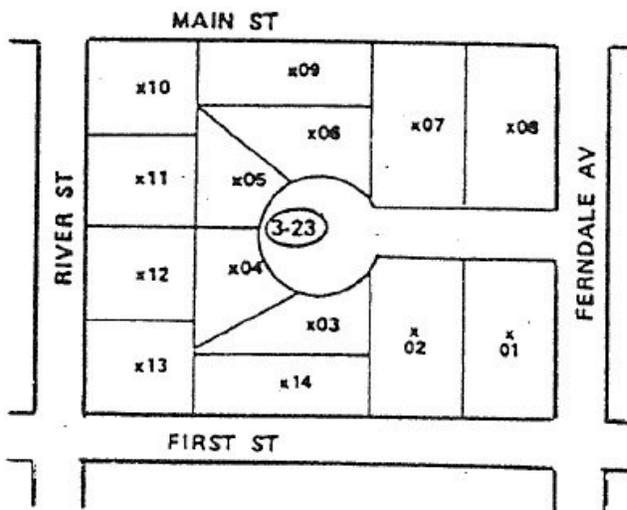


Fig. 15. Quarter section number on a cul-de-sac.

Parcels on an alley – If a parcel fronts on an alley, number that parcel after the parcel that is in front of it. Frequently, a parcel is the back half of several lots and is fronting on the cross street. Again, number that parcel in sequence with the parcel in front of it. (See Fig. 16.)

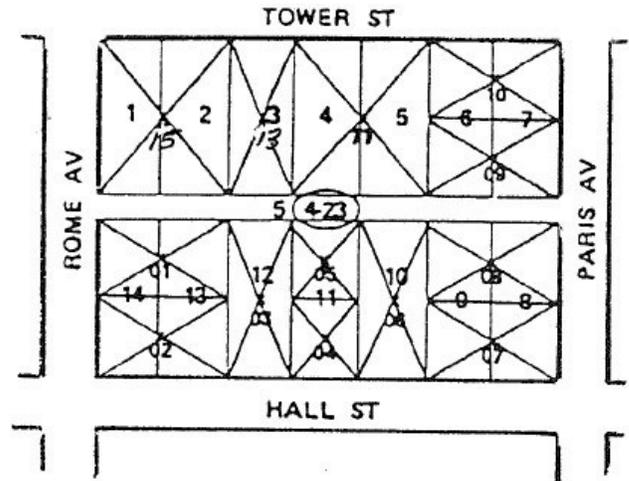


Fig. 16. Quarter section numbering on an alley-divided lot.

Parcels in an area of mixed property type – In areas of mixed property types (i.e. residential and agricultural) and/or varying sized parcels, number all Quarter Section Lot parcels as if driving from one “front door” to the next. Access to the improvements on the parcel for field appraisal work should be of prime consideration. (See Fig. 17.)

While it is desirable to consecutively number lots, it may not be prudent to do so.

Depending on the locale, the sale activity, etc., consecutively numbering lots may cause more work than is necessary. Individuals aware of the local development situation should be consulted before lot numbering.

### UNIQUE QUARTER SECTION LOTS

Quarter Section Lots are an identifier of ownership. The following types of ownerships are uniquely coded and are therefore treated separately.

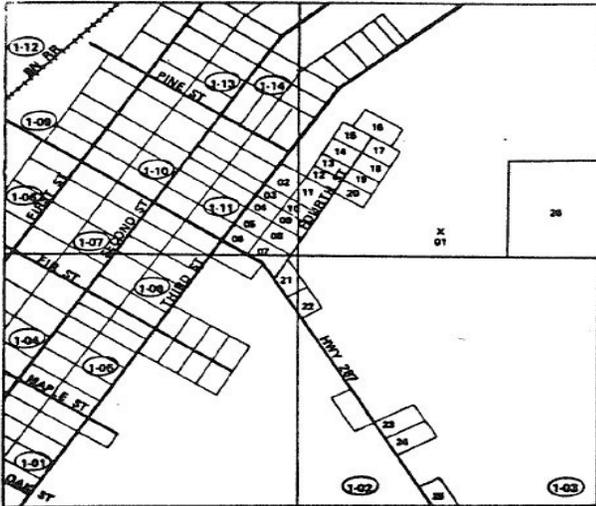


Fig. 17. Quarter section numbering in an area of mixed property types.

## UNIT NUMBER

The unit number is the portion of the geocode that follows the quarter section lot number. Even though the number has the capability to have either alpha or numerical characters, **THE RULES NOW REQUIRE ONLY NUMERIC NUMBERS TO BE USED.**

For standardization purposes, the first number of the four-digit unit number has been assigned to the following definitions for use. The remaining three characters may be used by each county at their discretion; **however, alpha characters are restricted from use.**

**It is not the intent of these issued standards to mandate changing non-compliant existing unit numbers at this time. It is the intent to have compliance for all future, new geocodes, and those that need to be changed, to adopt this unit number usage through normal working activities.**

Unit Number 0000: Land & Improvements/  
Splits

Unit Number 1000: Property Split by Levy

District Boundary

Unit Number 2000: Leased Railroad right-of-way Properties

Unit Number 3000: Oil Field Improvements Only

Unit Number 4000: Improvements Only

Unit Number 5000: Townhouses

Unit Number 6000: Fractional Interest Properties

Unit Number 7000: Condominiums

Unit Number 8000: Mobile Homes on Private Land

Unit Number 9000: Mobile Home Courts

Examples of these uses are as follows:

### Land and Improvement/Splits (0000)

Property where the land and improvements are of common ownership. An example would be Dave Ferguson has deeded ownership for both the land and improvements. Dave's geocode would be 05-2554-21-1-21-21-0000.

### Parcel Split by Levy District (1000)

Individual parcels that are split between different levy districts must have separate parcels created for each levy district. These unique parcels should be set up similarly to condominiums where the entire property value is calculated on one record with a portion of the value being allocated to the parcels found in each levy district. The value allocation should be based on the percentage of land and improvement area found within each district.

### **Leased Railroad Right of Way Properties (2000)**

Leased commercial or industrial properties that are located inside a railroad right-of-way. An example would be: Guy Dubois is leasing from the railroad 30,000 sq.ft. of land located inside Burlington Northern's Railroad right-of-way. On this 30,000 sq.ft., Guy has his grain elevator business for transferring the grain by train. The railroad right-of-way geocode is 05-1887-26-1-01-01-0000. Guy's leased land geocode would be 05-1887-26-1-01-01-2000. Guy's improvements on the leased land would be 05-1887-26-1-01-01-2001.

### **Oil Field Improvement Only (3000)**

Improvements on a property where the land and improvements are not of common ownership. An example would be: the land is owned by Rob Macioroski and the improvements are a substation owned or leased by Mike Bolenbaugh and an oil pump owned or leased by Kim Larsen. Rob's geocode would be 05-1781-05-1-01-01-0000. Mike's geocode would be 05-1781-05-1-01-01-3001 and Kim's geocode would be 05-1781-05-1-01-01-3002.

### **Improvements Only (4000)**

Improvements on a property where the land and improvements are not of common ownership. An example would be, the land is owned by Marge Graham and the improvements on the property is a grain elevator owned or leased by Rick Halvorson, while the grain storage tanks are owned or leased by Steve Wanninger. Marge's geocode would be 05-2112-12-1-01-01-0000. Rick's geocode would be 05-2112-12-1-01-01-4001 and Steve's geocode would be 05-2112-12-1-01-01-4002.

### **Townhouses (5000)**

Townhouses have 100% of land and improvements. An example would be Kim

Larsen owns Unit #1 of the Towncrest Townhouse. She owns 100% of the 2700 square feet of land under the townhouse unit and 100% of the unit improvements. Dave Ferguson owns Unit #2, also having 100% of the 2700 square feet of land. Kim's geocode would be 05-1888-28-1-28-01-5001. Dave's geocode would be 05-1888-28-1-28-01-5002

### **Fractional Interest Properties (6000)**

There are restrictions for the use of any fractional interest unit numbers. All uses should adhere to the DOR Procedure manual policy as noted in procedure number 2-3-015, Chapter 2, section 1.

Property which is owned by multiples ownership's with a divided interest. An example would be Tom DuPaul as 50% divided interest; Guy DuBois has 25% divided interest; Steve Wanninger has 12.5% divided interest; and Marge Graham has 12.5% divided interest. Because GIS doesn't allow multiple geocodes to a parcel, the parcel would have a "master" record with the geocode of 05-1996-12-1-01-12-6000. This geocode would be entered into CMAMA as a dummy geocode. Having a "6000" unit number code tells us that there are "fractional interest" ownership's to this property and they will have unit number of 6001, 6002, etc. on file.

With Tom having the highest percent of interest, he would be assigned the lowest unit number. Guy DuBois would follow having the next highest percent of interest, and following through to the lowest percent of interest. Tom's geocode would be 05-1996-12-1-01-12-6001, Guy's geocode would be 05-1996-12-1-01-12-6002, Steve's geocode would be 05-1996-12-1-01-12-6003 and Marge's geocode would be 05-1996-12-1-01-12-6004.

### **Condominiums (7000)**

Condominiums have 100% of improve-

ments and a specified percentage of the land. An example would be Vicki French owns Unit #501 of the Summercrest Condominiums. She owns 50% of the land and 100% of the unit improvements. Dick Venable owns Unit #502 of the Summercrest Condominiums. He has 50% of the land and 100% of the unit improvements. The land would obtain a separate geocode from the improvements due to the split interest of ownership. Summercrest Condominium's land would have the master geocode of 05-1888-33-1-35-01-7000. Unit #501's geocode would be 05-1888-33-1-35-01-7001. Unit #502's geocode would be 05-1888-33-1-35-01-7002.

### **Mobile Homes on Private Land (8000)**

Personal property mobile homes which are located on private land ownership. An example would be Dave Ferguson is the landowner, which has 3 mobile home sites he leases for mobile homes. Dave's geocode would be 05-1995-12-1-25-01-0000. Each mobile home would be assigned a number beginning with "8001" and ending with "8003." Their geocodes would be 02-1995-12-1-25-01-8001, 05-1995-12-1-25-01-8002, and 05-1995-12-1-25-01-8003.

### **Mobile Home Courts (9000)**

Personal Property mobile homes, which are located in a bona fide mobile home or trailer court. An example would be 45 mobile homes located in the "Evergreen Trailer Park." The geocode for the land to the trailer park would be 05-1888-18-1-41-01-0000. Each mobile home would be assigned a unit number beginning with "9001" and ending with "9045." Their geocodes would be 05-1888-18-1-41-01-9001 through 05-1888-18-1-41-01-9045.

**Below is another option for this category, which is available but RECOMMENDED FOR MINIMAL use only. This is strictly an option and does not have to be utilized.**

Split properties would fall under this same category, provided the land and improvements are of common ownership. This would be for properties that have been split and do not have a geocode lot number available to fit between the original geocode numbering method. This category is essential for keeping the geocoding system sequential. The unit number will begin with the leading zero, but the last three digits will begin with "001," increasing sequentially by one as needed. An example would be: 05-1888-01-1-01-01-0000 and 05-1888-01-1-01-02-0000 are existing geocodes. 05-1888-01-1-01-01-0000 splits into two properties. The newly split property would be assigned the same geocode as the original 05-1888-01-01-01-0000 only changing the unit number to "0001." This method allows the new parcel to fit numerically between the already existing geocodes.

## **MAP ID**

### **Optional**

Three character positions are provided to enter numeric characters denoting the division of properties defined on an individual map. The purpose of this field is for geographical sorting of output reports.

The Map Code uniquely identifies each map as to township, section and area. The Map Code, in total, is a nine-digit number consisting of three fields; ASSIGNED TOWNSHIP, SECTION, and MAP. Only the last three digits of the Map Code are to be coded in this field.

The Map Code is adaptable to all maps in all counties. The Map Code will be placed in the lower left-hand corner of the map and on any folder containing parcels geocoded on that map.

### **FIRST FIELD: ASSIGNED TOWNSHIP NUMBER**

Field one is the four-digit ASSIGNED TOWNSHIP NUMBER of the township in which the mapped area lies. Mapped areas of multiple townships will use the lowest numeric assigned township number.

### **SECOND FIELD: SECTION NUMBER**

The two-digit SECTION NUMBER is the second field. If the entire mapped area is in one section, use that section number.

For maps covering property in more than one section, but all in the same township, use the lowest section number.

For mapped areas in more than one township, use the lowest numbered section in the township with the lowest assigned township number. This may not always be the lowest section number on the map.

### **THIRD FIELD – MAP OR THE MAPPED AREA**

The third field of three digits MAP designates the mapped area. Any of the following eight methods may be used to designate the third field for a map.

Township maps and/or computer generated maps: These maps are always coded “XXX.”

Individual section maps: For a map of a complete section, this field is coded “XXX.”

Multiple maps of a section: It is possible to have several maps of the unplatted area of one section. In this case, the third field should be “XXX.” To differentiate these

maps, the appraiser may choose one of the following:

The last one or two spaces may be used for numeric digits reflecting a number assigned to the map.

Each map may carry a notation (aside from the code) to indicate it is one of several maps, (i.e., 1 of 2, 2 of 2). This would not be part of the actual map code and would primarily serve in the filing of and accounting for the maps.

Individual Subdivision/Addition: A map of a complete subdivision/addition will have that subdivision's or addition's three digit addition code for the third field.

Certificate of Survey: A certificate of survey will be treated exactly like an individual subdivision map using its three-digit addition code in this field.

Multiple maps of a Subdivision/Addition: If a subdivision, due to its scale and/or size, is drawn on more than one map, use the notation method of 1 of 4, 2 of 4, etc. This notation will not be coded but will serve in the filing of and the accounting for the maps.

Maps of Multiple Subdivisions/Additions: For maps covering more than one subdivision but not an entire municipality, the third field will be the alphabetically lowest addition code.

Municipality Maps: If an entire municipality is contained on one map, use the three-digit municipality code for this field. Do this even if there may be more than one subdivision in that municipality.